VOL. XI JANUARY 1957 NO. 1

PACIFIC SCIENCE

A QUARTERLY DEVOTED TO THE BIOLOGICAL AND PHYSICAL SCIENCES OF THE PACIFIC REGION

IN THIS ISSUE: Bryant and Gressitt — *Chrysomelidae of Fiji* • Dawson — *Annotated List of Marine Algae from Eniwetok* • NOTES: Strasburg and Hiatt — *Sexual Dimorphism in* Gomphosus • News Notes

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Although no manuscript will be rejected merely because it does not conform to the style of PACIFIC SCIENCE, it is suggested that authors follow the style recommended herein and exemplified in the journal.

(Continued on inside back cover)

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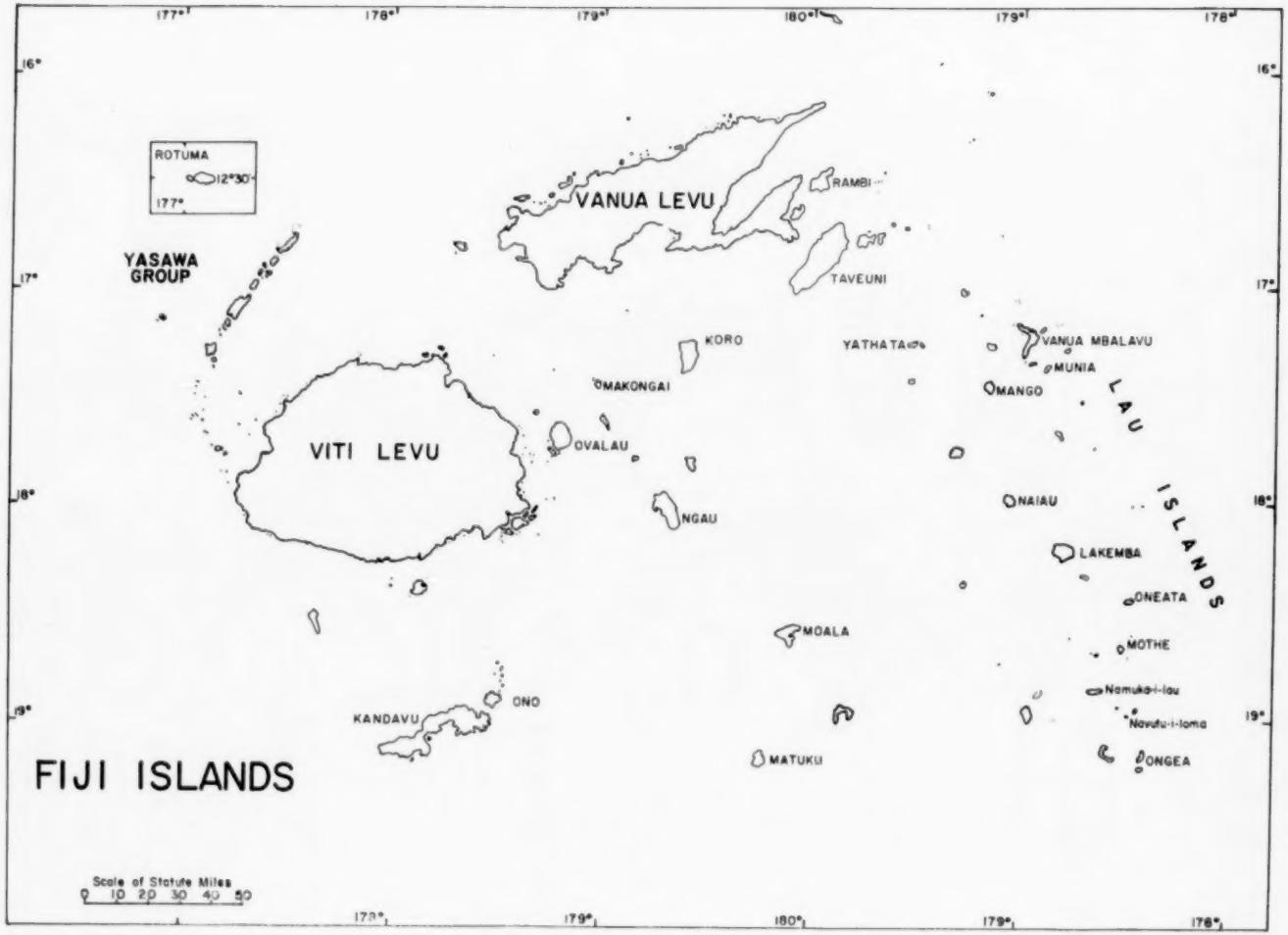
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Chrysomelidae of Fiji (Coleoptera)[1]

G. E. Bryant and J. L. Gressitt[2]

This report is based primarily on the extensive collection made by E. C. Zimmerman in 1938 as a member of the Bishop Museum's Henry G. Lapham Fijian Expedition. Additional material was taken by J. M. Valentine in 1937, N. L. H. Krauss in 1941, 1950, 1951, and 1955, E. H. Bryan, Jr. in 1924, and J. L. Gressitt in 1952 and 1955. A few other specimens were taken by Albert Koebele, J. F. Illingworth, H. S. Ladd, W. Greenwood, W. H. Ford, C. M. Cooke, Jr., Otto Degener, Yoshio Kondo, R. W. Paine, R. A. Lever, and B. A. O'Connor. A total of about 3,500 specimens from Fiji was available for study.

Much of the older material was originally sent to the late Dr. S. Maulik, who found little time to devote to it before his death. The senior author then undertook the study at the request of E. C. Zimmerman, and identified much of the material, preparing descriptions of some new species and notes on others. The junior author was asked to go over the unidentified material and newer collections, and has added to the keys and descriptions. He has also made a special effort to obtain records with host-plant data during a visit to Vanua Levu in 1955. Because the work was largely done separately, the new species are individually credited to the describers. We are much indebted to Mr. Zimmerman for time spent in sorting the material, and in helping to compile the list of previously recorded species.

The host plants were kindly identified by A. C. Smith. Some host data and other information was supplied by B. A. O'Connor. The drawings of adults were made partly by the senior author, and partly by Dorothy Rainwater. The drawings of the genitalia were prepared by the junior author.

All types (with one exception) are deposited in Bishop Museum (Bishop), with paratypes in the British Museum of Natural History (BM). Some paratypes are also deposited in the United States National Museum (US), the Commonwealth Scientific and Industrial Research Organization (CSIRO) in Canberra, and the California Academy of Sciences (CAS).

There are two systems of romanization of Fijian place names. The long-used system in Fiji utilizes "c" for the "th" sound, and "q" or "g" for the "ng" sounds. Instead of the former system, the actual phonetic spellings are used in this paper. When the old spellings occur on specimen labels, they are inserted in the text in parentheses following the phonetic spellings.

SPECIATION AND ZOOGEOGRAPHY

This very interesting collection, a tribute to Mr. Zimmerman's interest, has proven to be a most difficult one on which to report.

[1] This research was aided by a John Simon Guggenheim Memorial Foundation Fellowship to the junior author, 1955–1956. Manuscript received December 30, 1955.

[2] Commonwealth Institute of Entomology, London, and Bernice P. Bishop Museum, Honolulu, respectively.

Generic and specific boundaries have not been easy to determine, and, after repeated study, some specimens must still be left unidentified and others given questionable generic placement. Furthermore, the major part of the material belongs to the subfamily Eumolpinae, which is known for the difficulty of tribal and generic placement of its members. It may be of interest to quote Maulik's statement [1929: 191]: "The study of the Eumolpinae of the present collection lends support to an idea which suggested itself to me when I was studying other island faunas, such as that of the Seychelles. In that case also I was confronted with the same difficulty of judging the limits of a species which showed structural variations. The idea may be formulated thus: in island faunas species tend to become more plastic than in continental faunas." This statement would appear to apply very well also to the chrysomelid fauna of Fiji, and particularly to that of the subfamily Eumolpinae.

Fiji has a rather rich insect fauna, possessing many genera not found farther east in the Pacific. Also, the endemicity is rather high. Only six of the fifteen Asiatic subfamilies of Chrysomelidae are represented in Fiji, whereas twice as many, or more, are represented in New Guinea. Thus it would appear safe to say, from consideration of this family of beetles, that Fiji represents an oceanic island group, or a relic continental group, which lost much of its original fauna through partial submersion, vulcanism, or tectonic activity.

Fiji possesses many old metamorphic and plutonic rocks, suggesting that it was part of an ancient Melanesian continent (Ladd, 1934: 49). On the other hand, Mayr (1941: 191–195) and Myers (1953: 19–27) have shown that the vertebrate fauna indicates that Fiji is oceanic rather than continental. The junior author feels that if Fiji were continental in the full sense, then more subfamilies, tribes, and genera of Chrysomelidae should be represented (see Gressitt, 1956: 14). The situation in this family appears to differ from that in the Tenebrionidae as discussed by Kaszab (1955: 430), who concluded that the Fijian fauna was continental.

The Fijian chrysomelid fauna is characterized by a fairly small number of genera (35), many of which have developed a considerable number of species. There are four genera with species thought to be all introduced, or of doubtful generic placement. The remaining 31 genera possess an average of 4.3 species per genus in Fiji. Actually the ratio is still greater, as a number of species represented by uniques are left unnamed. Seven genera have over six species, five genera have over eight species, and three have over ten species. There are three endemic genera, besides some which may need naming.

The distribution of the 32 non-endemic genera, including those with introduced species, is as follows:

	NUMBER OF GENERA
Fiji and Samoa only	2
Fiji, Samoa, New Hebrides	1
Fiji and New Hebrides	2
Fiji and New Zealand	2
Fiji and Australia	2
Fiji and Papuan Subregion	2
Fiji and Solomons	2
(one also in New Hebrides and Samoa)	
Fiji and Philippines	1
Fiji and Africa	1
(also Madagascar, New Caledonia, and perhaps Australia)	
Fiji and Oriental Region	9
(some occurring also in New Guinea or intermediate islands)	
Cosmopolitan	8

Hence the relationships appear to be with Southeast Asia, through New Guinea, much more than with the Australian region. Nine of the twelve chrysomelid genera in Samoa are also found in Fiji. Six of the 17 Micronesian genera also occur in Fiji.

Of the 137 species or subspecies listed in this work, 127 appear to be endemic to Fiji.

The following five species appear to be introduced to Fiji:

Aulacophora nigrivestis (Boisduval)
Aulacophora quadrimaculata (Fabricius)
Aulacophora similis (Olivier)
Plesistia brunnea Maulik
Altica corusca Erichson

Possibly *Plesistia brunnea* evolved in Fiji, and was introduced to Samoa. It is also possible that *Promecotheca caeruleipennis* Blanchard (*reichii* Baly) might have been introduced from Tonga to Fiji, or vice versa. Taylor (1937) considered it indigenous to Fiji.

Thus, except for the preceding two species and *Vitibia formosa* (Baly), *Phyllotreta blackburni* Bryant, and the genus *Eurydemus*, all of the non-introduced species in Fiji appear to be endemic. Seventy-one kinds are described in this paper as new, and, of these, six are new subspecies. Two new genera are proposed.

Local endemicity within Fiji appears to be clearly developed. The species from Kandavu, Moala, and Lau are in many cases different from those of the main islands, and different from each other. Many of the species from Ovalau appear to be the same as those on Viti Levu, and a similar relationship appears to exist between those of Taveuni and Vanua Levu. As to Viti Levu and Vanua Levu, there appear to be both species in common and sibling species or separate races on the two islands. A number of species listed as common to the two main islands may actually consist of weak separate races. Again, the problem of determining limits of species renders most difficult the decisions on monoinsular endemicity.

TABLE 1
DISTRIBUTION OF FIJIAN CHRYSOMELIDAE

	Viti Levu	Ovalau	Vanua Levu	Taveuni	Central Fiji	Lau I.	Kandavu	OTHER LOCALITIES
CRYPTOCEPHALINAE								
1. *Coenobius geniostomae* Gr., n. sp.			×					
2. *C. m. marginipennis* Bry.	×		×	×				
3. *C. m. lauensis* Gr., n. subsp.						×	×	
4. *C. producticollis* Gr., n. sp.	×	×						
5. *C. zimmermani* Gr., n. sp.		×						
6. *Ditropidus punctulatus* Chapuis						×		
7. *D. tibialis* Chapuis	?							
8. *Pycnophthalma cuprea* Bry.	×							
9. *P. aureopilosus* (Bry.)	×							
10. *P. apicale* Bry., n. sp.	×							
11. *P. leveri* Bry.	×							
12. *Loxopleurus costipennis* Bry.	×					×		
13. *L. leveri* Bry.						×		
14. *L. ruficollis* Bry., n. sp.	×					×		
15. *L. vitiensis* Bry.	×							
16. *L. rotumanus* Gr., n. sp.								Rotuma
17. *Cryptocephalus fraterculus* Chapuis	×							
EUMOLPINAE								
18. *Lindinia glabrata* Bry., n. sp.	×							
19. *Rhyparida dispar* Bry.	×		×					
20. *R. trapezicollis* Fairmaire	×	×	×					
21. *R. oblonga* Bry., n. sp.	×							
22. *R. fijiensis* Gr., n. sp.	×							

TABLE 1 (*continued*)
DISTRIBUTION OF FIJIAN CHRYSOMELIDAE

CRYPTOCEPHALINAE	Viti Levu	Ovalau	Vanua Levu	Taveuni	Central Fiji	Lau I.	Kandavu	OTHER LOCALITIES
23. *R. laddi* Gr., n. sp.	×							
24. *R. luteola* Fairm.	×		×					
25. *R. vermiculata* Gr., n. sp.						×		
26. *R. kandavu* Gr., n. sp.							×	
27. *R. strigosa* (Bry.)	×							
28. *R. bryani* Gr., n. sp.						×		
29. *Labasa scutellaris* Bry.	×		×					
30. *Vitibia formosa* (Baly)	×		×				×	New Hebrides
31. *V. rufoviolacea* Fairm.	×							
32. *V. montana* Gr., n. sp.	×							
33. *V. greenwoodi* (Bry.)	×	×						
34. *V. striatipennis* Bry., n. sp.	×							
35. *V. vitiensis* (Bry.)	×	×		×	×	×		
36. *V. melochiae* Gr., n. sp.	×		×				×	
37. *V. duplicata* Gr., n. sp.	×							
38. *V. rufilabris* Bry., n. sp.	×							
39. *V. obscura obscura* Gr., n. sp.	×							
40. *V. o. submetallica* Gr., n. subsp.			×					
41. *V. bryanti* Gr., n. name	×							
42. *V. testacea* Gr., n. sp.	×	×						
43. *V. virida* Gr., n. sp.	×							
44. *V. dimorpha* Gr., n. sp.	×							
45. *V. pallipes* Bry., n. sp.	×							
46. *Stygnobia evansi* (Bry.), n. comb.				×				
47. *S. oconnori* Gr., n. sp.	×	×	×			×		
48. *S. albiseta* Gr., n. sp.					×			
49. *S. metallica* Bry.	×	×	×	×				
50. *S. elliptica* Gr., n. sp.	×							
51. *S. nandarivatu* Gr., n. sp.	×							
52. *S. leveri* (Bry.), n. comb.	×	×	×	×				
53. *S. ovalaua* Gr., n. sp.	×	×			×			
54. *Epinodostoma alocasiae* Gr., n. sp.			×					
55. *E. elongata* Bry., n. sp.	×							
56. *Eurydemus grandis* (Baly)		×	×				×	New Caledonia
57. *E. insignis* Chapuis				×				Australia
58. *Stethotes rufipes* Bry.	×							
59. *S. setosa* Gr., n. sp.	×							
60. *Parademotina aureotincta* Gr., n. sp.	×							
61. *Demotina pallipes* Bry., n. sp.						×		
62. *D. glochidiona* Gr., n. sp.			×					
63. *D. fulva* Bry.	×		×			×		
64. *D. metallica* Bry., n. name	×	×	×					
65. *D. vitiensis* Bry.	×	×	×			×		
66. *D. bifasciata* Bry., n. sp.	×							
67. *D. albonotata* Bry.	×	×			×			
68. *D. evansi* Bry.			×	×				
69. *D. obscurata* Bry.	×		×	×				
70. *D. dissimilis* Bry.	×	×	×	×	×	×		
71. *D. irregularis* Bry., n. sp.	×							
72. *D. striata* Bry., n. sp.	×	×						

	Viti Levu	Ovalau	Vanua Levu	Taveuni	Central Fiji	Lau I.	Kandavu	OTHER LOCALITIES
73. *D. pubescens* Gr., n. sp.					×			
74. *D. veitchi* Bry.	×	×	×					
75. *D. fragilis* Gr., n. sp.	×	×						
76. *D. nodosa* Bry., n. sp.	×							
77. *D. rugosata* Gr., n. sp.	×	×	×					
78. *D. cylindricollis* Gr., n. sp.	×							
79. *Damelia marshalli* Clark	×							
80. *D. verrucosa* Bry., n. sp.	×	×						
81. *D. rugosa* Bry., n. sp.	×							
82. *Eucolaspis castanea* Bry., n. sp.	×							
83. *E. saltator* Gr., n. sp.			×					
84. *Colaspoides brunnea* Bry., n. sp.	×	×						
85. *C. confusa* Gr., n. sp.	×							
86. *C. vitiensis* Bry.	×		×		×			
CHRYSOMELINAE								
87. *Plagiodera violaceicognis* Bry.	×	×	×			×		
GALERUCINAE								
88. *Aulacophora nigrivestis* (Boisd.)	×							Australia
89. *A. quadrimaculata* (Fabr.)	×	×				×	×	Yasawa, Samoa, Melanesia, Queensland, W. Micronesia
90. *A. similis* (Oliv.)	×	×	×	×	×	×	×	S. E. Asia, Melanesia, W. Micronesia, Samoa
91. *Malacotheria funerea* Fairm.	×							
92. *M. strigiscutata* Fairm.	×	×						
93. *M. lateritia* Fairm.	×	×	×					
94. *Plesistia brunnea* Maulik	×							Samoa
95. *Haplosomoides binotata* Bry., n. sp.	×	×						
96. *Khasia nigra* Bry.	×	×						
97. *K. nitida* Bry., n. sp.	×							
98. *K. r. rugosa* Bry., n. sp.	×	×						
99. *K. r. callosa* Gr., n. subsp.			×					
100. *Cerophysa vitiensis* Bry.	×							
101. *Monolepta (Metriona) s. signatipennis* (Fairm.)	×	×						
102. *M. (M.) s. lauana* Gr., n. subsp.						×		
103. *M. (M.) s. kandavuna* Gr., n. subsp.							×	
104. *M. (M.) moala* Gr., n. sp.					×			
105. *M. (M.) zimmermani* Bry., n. n.	×	×						
106. *M. (M.) vitiensis* Bry.			×					
ALTICINAE								
107. *Phyllotreta blackburni* Bry.	×							New Hebrides
108. *Aphthona veitchi* Bry.	×	×						
109. *A. greenwoodi* Bry.	×							
110. *A. lamia* Gr., n. sp.	×							
111. *A. senetiki* Gr., n. sp.			×					
112. *Altica cornusa* Erichson	×	×	×			×		Tasmania, New Hebrides

TABLE 1 (*continued*)
DISTRIBUTION OF FIJIAN CHRYSOMELIDAE

	Viti Levu	Ovalau	Vanua Levu	Taveuni	Central Fiji	Lau I.	Kandavu	OTHER LOCALITIES
113. *Crepidodera oceanica* Gr., n. sp.	×							
114. *C. elongata* Gr., n. sp.		×						
115. *C. evansi* Bry				×				
116. *C. fijiensis* Csiki	×		×					
117. *C. kraussi* Gr., n. sp.	×							
118. *C. rotunda* Gr., n. sp.	×							
119. *Psylliodes simmondsi* Bry	×							
120. *P. vitiensis* Bry	×							
121. *Alema leveri* Bry				×				
122. *A. nigra* Bry	×							
123. *Manobia metallica* Bry	×							
124. *M. levicollis* Gr., n. sp.	×							
125. *M. obtusicollis* Gr., n. sp.	×							
126. *M. producticollis* Gr., n. sp.	×							
127. *Nesohaltica brunnea* Bry., n. sp.	×							
128. *N. lauensis* Gr., n. sp.						×		
129. *N. vitiensis* Bry		×	×					
130. *Febra venusta* Clark	×	×	×					
131. *F. insularis* Bry	×							
132. *F. varioloidea* Fairm.		×						
133. *F. rubra* Gr., n. sp.	×							
134. *F. n. nigroornata* Bry., n. sp.	×							
135. *F. n. vanuana* Gr., n. subsp.			×					
HISPINAE								
136. *Promecotheca caeruleipennis* Blanchard	×	×	×	×	×	×	×	Yasawa, Samoa, Tonga
137. *P. bicolor* Maulik	×		×					

KEY TO SUBFAMILIES OF *CHRYSOMELIDAE* FOUND IN FIJI

1. Head normal, with vertex not projecting and with mouth directed forward or downward 2

   Head with vertex projecting strongly forward and mouth directed posteriorly below . . . . . **Hispinae**

2(1). Antennae closely inserted on front of head; elytra not very rigid 3

   Antennae not closely inserted, separated by frons or vertex; elytra generally somewhat rigid 4

3(2). Posterior femur not greatly enlarged . . . . . **Galerucinae**

   Posterior femur strongly swollen, adapted for jumping . . . . . **Alticinae**

4(2). Middle three abdominal sternites not constricted; form of body more or less ovate or rounded, often strongly convex and constricted anteriorly 5

   Middle three abdominal sternites constricted in central portions; form of body subcylindrical; antenna often slender . . . . . **Cryptocephalinae**

5(4). Wing venation greatly reduced; cubital veins lacking; clypeus divided into two parts; body rounded and depressed . . . . . **Chrysomelinae**

   Wing venation not reduced; cubital

veins present; clypeus not divided; body very convex; elytra often broader than prothorax . . . . . **Eumolpinae**

Subfamily *CRYPTOCEPHALINAE*

KEY TO FIJIAN GENERA OF CRYPTOCEPHALINAE

1. Antenna generally much shorter than body, usually thickened distally; pygidium not conspicuously exposed (MONACHINI) 2

   Antenna generally nearly as long as body, slender; pygidium more or less conspicuously exposed (CRYPTOCEPHALINI); prosternum dilated forward toward mouth parts . . . . **Loxopleurus**

2(1). Dorsum glabrous and shiny, lacking scale-like hairs; pronotum not produced over scutellum 3

   Dorsum often bronzy, clothed with small scale-like hairs; pronotum produced over scutellum, sometimes hiding it . . . . . **Pycnophthalma**

3(2). Prothorax more or less collared at apex, generally also punctured or grooved parallel to basal margin; scutellum narrow, tapering . . . . . **Coenobius**

   Prothorax rarely margined or collared at apex, rarely punctured or margined parallel to basal margin; scutellum short, scutiform . . . . . **Ditropidus**

Tribe MONACHINI

Genus COENOBIUS Suffrian

Coenobius Suffrian, 1857, Linn. Ent. 11: 61 (type: *C. triangulum* Suffr.; Africa).

Head broad and depressed, epistoma joined with the front. Eyes large, strongly notched, touching each other. Antenna short, first segment oblong ovate, second shorter and more slender, the six apical dilated. Prothorax contracted in front, somewhat convex, all the angles well marked, posterior margin serrate with a median lobe not very prominent. Scutellum with the sides parallel on basal two-thirds, converging to the apex, which is slightly raised. Elytron convex near scutellum, slanting steeply at side, shoulder prominent and epipleuron well marked; surface evenly punctate-striate. Prosternum one and a half times broader than long, slightly produced at anterior margin, with a marginal impression, posterior margin emarginate, with lateral angles prominent. Legs short; tarsi with third segment strongly notched, claw segment almost entirely engaged in the preceding and claws dilated and toothed basally.

KEY TO FIJIAN SPECIES OF *Coenobius*

1. Anterior end of prothorax less than three-fifths as broad as base of prothorax 2

   Anterior end of prothorax more than three-fifths as broad as base; pronotum pale, sparsely punctured; elytron darkened in scutellar area . . . . . **geniostomae**

2(1). Dorsum, or at least elytron, dark pitchy 3

   Dorsum largely pale reddish testaceous, rarely marked with pitchy black on border, or outer portion, of disc of elytron 4

3(2). Pronotum more or less vertical at side and with a distinct oblique groove, generally pitchy with side paler; posterior process of pronotum emarginate; elytron punctured in grooved rows above as well as at side . . **zimmermani**

   Pronotum not vertical at side and without an oblique groove, the lateral margin distinctly flattened, generally entirely dark except for anterior collar, but sometimes with basal portion slightly paler; posterior process of pronotum large, not emarginate; elytron smooth above, with four distinct grooves at side . . . . . **producticollis**

4(2). Discal punctures of elytron in part as large as interspaces; prothorax distinctly grooved at side; frons nearly

impunctate . . . . . **marginipennis marginipennis**

Discal punctures of elytron much smaller than interspaces; prothorax feebly grooved at side; frons distinctly punctate . . . . **marginipennis lauensis**

1. ***Coenobius geniostomae*** Gressitt, n. sp.

FEMALE: Testaceous, largely transluscent or transparent, somewhat ochraceous on center of pronotum and middle of metasternum; elytron blackish on base and suture and obliquely on scutellar portion, and pitchy on outer margin; antenna pale on scape, dull ochraceous on next four segments, pitchy on remainder.

Head flat in front, round in outline, sparsely punctured on frons. *Antenna* two-thirds as long as body, fairly slender; scape fully as long as next two segments together; third slightly longer than second, fourth, and fifth; following longer and stouter, subequal. *Prothorax* five-eighths as long as broad, broad anteriorly, shiny, sparsely punctured, obliquely grooved at side; basal margin produced and emarginate opposite scutellum. *Scutellum* slender, narrowed apically. *Elytron* slightly narrowed between postbasal and preapical portions, distinctly punctured in regular rows, the punctures in most cases much narrower than interpunctural rows. *Ventral surfaces* closely punctured on side of thorax and second and following abdominal sternites; first sternite nearly as large as remainder of abdomen. First hind tarsal segment as long as next two combined. Length 2.5 mm.; breadth 1.5 mm.

VANUA LEVU: Holotype, female (BISHOP 2403), between Navakuru and Nakawanga, 300 m., on *Geniostoma vitiense*, Oct. 7, 1955, Gressitt; paratype, female, same data.

HOST: *Geniostoma vitiense* Gilg and Benedict.

Differs from *C. marginipennis* Bryant in being stouter, with the prothorax shorter and broader anteriorly, the antenna partly darkened, and the elytron punctured but not grooved. The paratype lacks the black on scutellar portion of the elytral disc.

2. **Coenobius marginipennis marginipennis** Bryant

Coenobius marginipennis Bryant, 1938, Roy. Ent. Soc. London, Proc. B 7(11): 249. (Vanua Levu; type in Brit. Mus.)

Pale fulvous; elytron narrowly margined with fuscous; antenna with five basal segments fulvous and six apical segments tinged with fuscous.

Head impunctate; eyes meeting above. *Antenna* with six apical segments broader; scape nearly as long as second to fourth combined. *Prothorax* shiny, transversely grooved near anterior margin; side with an oblique groove; base produced into a lobe at middle. Scutellum impunctate, narrowly elongate. *Elytron* finely punctate-striate, interstices at side slightly convex. *Pygidium* closely punctured and clothed with very fine golden pubescence. First abdominal segment very long; second and third short and equal; last about equal to second and third combined. Length 2.5 mm.

VITI LEVU: Thuvu, Lautoka (after Bryant); nineteen, Lami Quarry, near Suva, Feb. 1951, Krauss; ten, Raki Raki, Lami, Lautoka, and Ndeumba, Jan. and Mar. 1955, Krauss.

VANUA LEVU: Type from Lambasa. Sixteen, eight, east of Lambasa, on *Glochidion cordatum*, Oct. 6, 1955, Gressitt; four, Nakawanga, on *Glochidion ramiflorum*, Oct. 8, 1955, Gressitt.

TAVEUNI: After Bryant.

HOSTS: *Glochidion cordatum* (Muell. Arg.) Seem.; *G. ramiflorum* Forst.

3. ***Coenobius marginipennis lauensis*** Gressitt, n. subsp.

Fig. 1

MALE: Pale ochraceous, slightly duller on distal half of antenna, narrowly pitchy on basal margin of prothorax. Legs and ventral surfaces sparingly clothed with short suberect pale hairs.

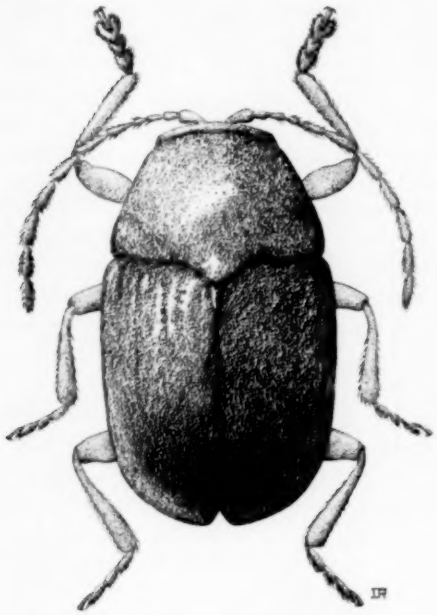

FIG. 1. *Coenobius marginipennis lauensis* Gressitt, n. subsp.

Head moderately punctured; eyes touching above. *Antenna* three-fourths as long as body, sixth and following segments thickened. *Prothorax* shiny, feebly punctured, feebly grooved at side. *Scutellum* subelliptical, about three times as long as broad. *Elytron* with ten regular rows of punctures which are mostly much smaller than spaces between them, longitudinally and transversely. *Ventral surfaces* in part punctured, largely impunctate on metasternum and first abdominal sternite. *Pygidium* closely punctured. Length 2.4 mm.; breadth 1.35 mm.

FEMALE: *Antenna* three-fifths as long as body; last six segments moderately thickened and pitchy. Length 2.5 mm.; breadth 1.6 mm.

LAU: Holotype, male (BISHOP 2385), Naiau I., Fiji, Sept. 12, 1924, E. H. Bryan, Jr.; allotype , female (BISHOP), by seashore near Loma Loma, Vanua Mbalavu I., Aug. 7, 1938, Zimmerman.

KANDAVU: A third specimen, male, from Kaivala, Apr. 29, 1941, Krauss, is also referred to this subspecies.

Differs from *C. marginipennis marginipennis* Bryant in being larger, entirely testaceous except for antenna, and in having the frons punctured, the pronotum less distinctly grooved at side, and the elytral punctures mostly much smaller than spaces between them.

4. ***Coenobius producticollis*** Gressitt, n. sp.
Fig. 2*a*, *b*

MALE: Reddish brown to dark pitchy, largely pitchy above; ventral surfaces slightly paler; base of antenna, front of head, and legs testaceous; fourth and following antennal segments gradually darked, last nearly black; pygidium brown. Antenna, legs, and ventral surfaces sparingly clothed with short oblique pale hairs.

Head finely and irregularly punctured, somewhat raised on frons; eyes touching above. *Antenna* three-fourths as long as body, last five segments moderately thickened; scape hardly as long as second and third segments combined; second to fourth subequal in length, second more swollen. *Prothorax* just over two-thirds long as broad, much wider near base than at apex; lateral margin flattened, broadly expanded basally; apical collar moderately developed; median basal process

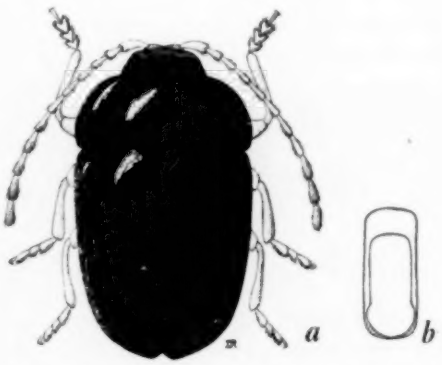

FIG. 2. *Coenobius producticollis* Gressitt, n. sp.; *a*, type; *b*, aedeagus.

well developed, subacute; disc convex, nearly impunctate, shiny, feebly grooved obliquely near middle of side of basal margin. *Scutellum* small, suboblong, about twice as long as broad. *Elytron* nearly impunctate, and ungrooved, on upper portion of disc, but with four deep grooves, hardly punctured, at side, none of which reach apex. *Ventral surfaces* sparingly punctured. *Pygidium* moderately punctulate. *Legs* short and stout. Length 1.65 mm.; breadth 0.94 mm.

FEMALE: Dorsum slightly paler on elytron. Antenna two-thirds as long as body. Length 2 mm.; breadth 1.1 mm.

VITI LEVU: Holotype, male (BISHOP 2398), ridge west of Vatuthere, alt. 900 m., Nandarivatu, Sept. 8, 1938, beating, Zimmerman; allotype, female (BISHOP), Nandarivatu, 1100 m., Sept. 6, 1938, Zimmerman. Two paratypes, male and female (BM), same data as allotype.

OVALAU: Two paratypes, both females (BISHOP), Andubangda, 600 m., Aug. 15, 1938, Zimmerman.

The Ovalau specimens have the pronotum paler, particularly apically and basally.

Differs from *C. marginipennis* Bryant in being smaller, darker, with the prothorax less convex, more broadly expanded on lateral margin, less punctate above, and more grooved at side.

5. *Coenobius zimmermani* Gressitt, n. sp.

Fig. 3

MALE: Dark chestnut brown to pitchy; head, legs, and last abdominal sternite testaceous; antenna testaceous basally, pitchy on last six segments. Ventral surfaces sparingly clothed with short pale hairs; antenna more densely clothed.

Head with a few punctures; frons narrow and slightly raised; eyes touching above, deeply emarginate. *Antenna* three-fourths as long as body; scape longer than second and third segments combined; second much shorter than third; last six segments thickened. *Prothorax* two-thirds as long as broad, practically as broad as elytra, strongly narrowed anteriorly, distinctly collared at apex; disc sparsely and shallowly punctured, distinctly grooved obliquely at side. *Scutellum* slender, narrowed posteriorly, more than twice as long as broad. *Elytron* moderately punctured in ten distinct grooves, the last two deep; most of punctures smaller than spaces between them longitudinally. *Ventral surfaces* sparingly punctured, densely punctured on metepisternum, and moderately so on last abdominal segment. *Legs* fairly stout. Length 1.92 mm.; breadth 1.2 mm.

FEMALE: Pronotum pale on each side; ventral surfaces testaceous except for pitchy metasternum. Length 2.28 mm.; breadth 1.2 mm.

Paratypes: Length 1.2–2.4 mm.; breadth 0.93–1.3 mm.

OVALAU: Holotype, male (BISHOP 2399), Andubangda, 600 m., July 15, 1938, Zimmerman; allotopotype, female (BISHOP), same data; four paratopotypes, two males and two females (BISHOP, BM), same data.

Differs from *C. producticollis* in being slightly larger, with ventral surfaces paler, the pro-

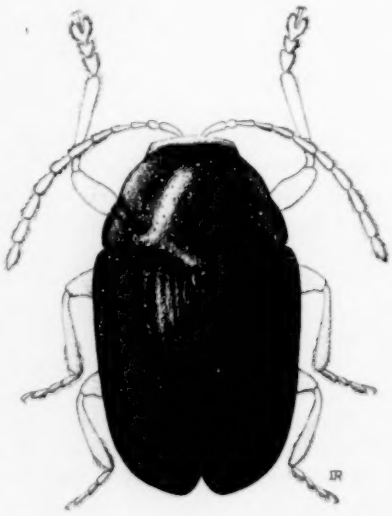

FIG. 3. *Coenobius zimmermani* Gressitt, n. sp.

thorax less expanded at side, less produced at middle of base, and with the elytron having ten distinct grooves, all punctured, with only the outer two grooves deep.

Genus DITROPIDUS Erichson

Ditropidus Erichson, 1842, Arch. f. Naturgesch. 8(1): 120.

Pleomorpha Saunders, 1847, Ent. Soc. London, Trans. 4(4): 268.

Broadly ovate. Eyes large, nearly touching. Antenna moderately thickened, barely more than one-half as long as body. Prothorax strongly convex, not distinctly collared apically or grooved parallel to base, with a prominent basal process covering base of scutellum. Scutellum scutiform. Elytron seriate-punctate, hardly grooved, with epipleuron broad basally.

6. **Ditropidus punctulatus** Chapuis?

Ditropidus punctulum Chapuis, 1876, Soc. Ent. de Belg., Ann. 18 C. R.: LXXX (Australia, Fiji).

MALE: Dark reddish pitchy; legs testaceous; antenna testaceous with apex slightly dusky. Ventral surfaces, legs and antenna with short oblique goldish hairs.

Head finely punctured; frons raised, flat. *Antenna* three-fifths as long as body; scape longer than next two segments combined; eighth to tenth segments nearly as broad as long. *Prothorax* evenly convex, considerably narrowed apically, sparsely and minutely punctured; posterior process bluntly rounded apically. *Scutellum* short, scutiform. *Elytron* with ten rows of small distinct punctures, the largest punctures somewhat longitudinal, and nearly as long as interspaces longitudinally. *Pygidium* finely punctured; ventral surfaces moderately punctured. Length 1.5 mm.; breadth 1 mm.

LAU: Mvana, Vanua Mbalavu, 60 m., Aug. 1938, Zimmerman, three males.

7. **Ditropidus tibialis** Chapuis

Ditropidus tibialis Chapuis, 1876, Soc. Ent. de Belg., Ann. C. R. 18: LXXIX (Australia, Fiji).

This species was recorded long ago from Fiji, but seems to be lacking in the present collection.

DISTRIBUTION: Southeastern Australia, Fiji.

Genus PYCNOPHTHALMA Maulik

Pycnophthalma Maulik, 1929, Insects of Samoa 4 (3): 180 (type: *P. tutuilana* Maulik; Samoa).

Body ovate. Eyes large, touching each other on upper side of head, deeply emarginate. Antenna 11-segmented, extending almost to the middle of the body; six apical segments thickened. Prothorax narrow in front; base not margined, edge with serrations, part opposite scutellum produced into a lobe which ends in an acute point; side margined, anterior and posterior angles rounded. Scutellum visible from above, narrow, oblong with rounded apex and base fitting against point of prothoracic lobe. Elytra not broader at base than prothorax, each punctate-striate, punctures deeply imbedded in grooves, striae appear at least on discal area, to be inclined toward the suture. Viewed from above the pygidium not exposed. Underside with intercoxal process of prosternum almost quadrate or slightly longer than broad, with surface rough and coarsely pitted; sides margined, and posterior edge widely arched. Epipleuron of elytron broader at base and narrowed from middle to apex. Legs fairly stout, not long, so that when withdrawn they are not visible from above. Claw segment of tarsus projecting a little beyond bilobed segment; claws appendiculate.

KEY TO FIJIAN SPECIES OF *Pycnophthalma*

1. Scutellum not completely hidden; dorsum pitchy reddish to bronzy, with silvery and golden to grayish pubescence 2

Scutellum completely hidden; dorsum reddish coppery with golden bronzy pubescence, feebly depressed between prothorax and elytra. . . . . **cuprea**

2(1). Pronotum not deeply impressed near anterior margin except at side, distinctly depressed basally in lateral outline; dorsum pitchy reddish with varicolored scales; femora pale. 3

Pronotum deeply impressed near anterior margin; elytra bronzy black with grayish silvery scales; femora black. . . . . **leveri**

3(2). Body outline somewhat pentagonal; elytral apex pale reddish; base of prothorax distinctly depressed on each side of median process. . . . . **apicale**

Body somewhat regularly oval in outline; elytral apex not very pale; base of prothorax feebly depressed on each side of median process. . **aureopilosus**

8. **Pycnophthalma cuprea** Bryant

Pycnophthalma cuprea Bryant, 1942, Ann. and Mag. Nat. Hist. Ser. 11, 9: 508 (Fiji).

MALE: Dark bronzy pitchy, more reddish beneath; antenna testaceous basally, brownish distally; legs testaceous. Body clothed above with short oblique bronzy golden hairs, turning to silvery on side and apex of elytron.

Head with frons raised and micropunctulate. *Antenna* barely over one-half as long as body; scape as long as next two segments combined; last six segments each about as broad as long. *Prothorax* nearly twice as broad as long, obtusely rounded anteriorly; disc subclosely and distinctly punctured. *Scutellum* hidden. *Elytron* with regular rows of close longitudinal punctures, with interspaces somewhat closely punctured. *Ventral surfaces* unevenly punctured. Length 1.8 mm.

FEMALE: Antenna less than one-half as long as body. Length 2 mm.

VITI LEVU: Mt. Victoria, 1000 m., Tholo North, Sept. 1938, Zimmerman, 28 specimens.

9. ***Pycnophthalma aureopilosa*** (Bryant), n. comb.

? Coenobius aureopilosus Bryant, 1925, Ann. and Mag. Nat. Hist. Ser. 9, 15: 591 (Fiji; type in Brit. Mus.).

Pitchy brown, with dull golden, varying to silvery pubescence, above.

Head with eyes nearly touching; frons finely rugose-punctate, somewhat raised in middle. *Antenna* more than one-half as long as body in male, less than one-half as long in female; last six segments somewhat longer than broad. *Prothorax* fully two-thirds as long as broad, finely and closely punctured, distinctly depressed basally, and obliquely from base along side. *Scutellum* elliptical, a little longer than broad, smooth, concave basally. *Elytron* with distinct rows of elongate punctures, and fine punctures between rows. *Ventral surfaces* in part sparsely punctured. Length 1.9 mm.

VITI LEVU: Nandarivatu, 1100 m., Sept. 1938, Zimmerman (two), and Navai-Nasonga trail, 900 m., Sept. 1938, Zimmerman (one).

10. ***Pycnophthalma apicale*** Bryant, n. sp.

Fig. 4

Upperside metallic bronze-green, with apex of elytron narrowly flavous, clothed with short golden pubescence; elytron with side margin and apical half of suture showing white silky pubescence. Legs and antenna flavous.

MALE: *Head* with median portion clothed with short whitish pubescence, clypeus flavous, eyes large, touching at base. *Antenna* extending just beyond the base of elytra, flavous, first segment more than twice as long as second, third more slender and longer than second, the remainder about equal, six apical segments slightly thickened. *Prothorax* bronze-green, with dense short golden pubescence, transverse, widest at base, the base produced in a lobe opposite scutellum, sides rounded and contracted in front. *Scutellum* oblong very narrow. *Elytron* metallic bronze-green, apex

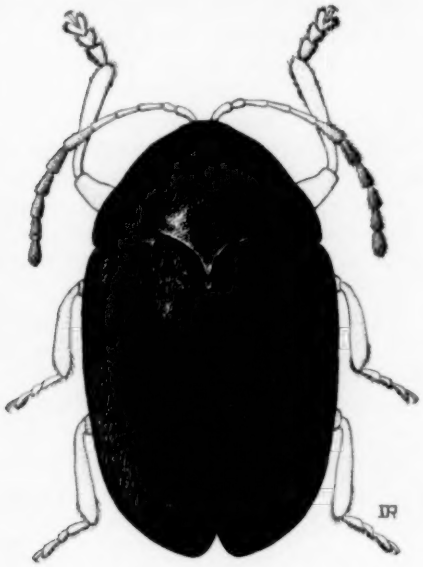

FIG. 4. *Pycnophthalma apicale* Bryant, n. sp.

narrowly flavous, clothed with short golden pubescence, except side margin and apical half of suture, which show short white silky pubescence, widest at base and slightly narrowed to apex. *Legs* flavous. *Underside* pitch black, clothed with very fine pubescence, with apical ventral segment flavous. Smaller than the female. Length 2–2.5 mm.; breadth 1.2–1.4 mm.

VITI LEVU: Holotype, male (BISHOP 2400), Nandarivatu, Viti Levu, 900–1000 m., Fiji, Sept. 3–6, 1938, Zimmerman; allotopotype, female and four paratopotypes, three males and one female, same data. One male paratype, Navai-Nasonga trail, west slope, 750–900 m., Sept. 12, 1938, Zimmerman; one female paratype, Mt. Victoria, west slope, Tholo North, 900–1200 m., Sept. 13, 1938, Zimmerman.

Allied to *P. cuprea* Bryant, but differs in the color and arrangement of the pubescence on the elytron, and in having the apex of the elytron flavous.

11. Pycnophthalma leveri Bryant

Pycnophthalma leveri Bryant, 1942, Ann. and Mag. Nat. Hist. Ser. 11, 9: 509 (Fiji; type in Brit. Mus.).

Dorsum bronzy; venter black; pronotum clothed with fine pubescence; elytron with small grayish silvery scales. *Head* impunctate; *antenna* reaching slightly beyond base of elytron; scape nearly twice as long as pedicel; third to fifth segments more slender, each longer than second and about equal to each other, the terminal segments slightly thickened. *Pronotum* bronzy with very fine punctures and fine scattered pubescence; front margin deeply impressed; side feebly margined. *Scutellum* oblong and very small. *Elytron* bronzy, clothed with very small grayish silvery scales, very finely punctate-striate, the three striae near side margin deeper. *Legs* with femora black, tibiae and tarsi flavous. Length 2 mm.

VITI LEVU: Nandarivatu (type series).

Tribe CRYPTOCEPHALINI

Genus LOXOPLEURUS Suffrian

Loxopleurus Suffrian, 1859, Linn. Ent. 13: 125; Chapuis, 1874, Gen. Col. 10: 186.

Head of medium size, engaged in prothorax; labrum large, free and almost entire; eye rather large, canthus triangular, measuring half the breadth of an eye. Antenna filiform, very slightly compressed towards the apex, shorter than the body in both sexes, extending half the length of body in female. Prothorax contracted in front, produced towards anterior angles, somewhat convex on disc, and slightly produced in middle of anterior border, side margin almost straight, entire, a little raised, posterior margin with a median lobe, two strong impressions near the scutellum, diverging towards anterior angles. Scutellum oblong, apex somewhat raised, an impression at base. Elytron elongate, subcylindrical, slightly broadening behind, epipleural lobes not prominent, shoulders well marked, with a lateral compression of the body, surface punc-

tate-striate, the rows sometimes confused and indistinct towards base. Prosternum with anterior border a little swollen opposite mouth parts, somewhat dilated behind anterior coxa, obliquely truncate on each side and forming a pentagon of which the summit rests on mesosternum. Legs slender; tarsi rather long, three basal segments triangular, subequal, claw segment terminated by two slender claws, dilated and sinuous at base.

KEY TO FIJIAN SPECIES OF *Loxopleurus*

1. Length 2.6–3.6 mm.; center of pronotal disc and elytral base generally dark; elytron generally with outer margin or a postmedian band also dark **2**

   Length 2.0–2.5 mm.; pronotum and elytron generally each uniformly pale or dark, or elytral disc dark with margins pale, or vice versa **3**

2(1). Frons coarsely punctured, raised at side; pronotum almost impunctate; elytral punctures feeble . . . . . **vitiensis**

   Frons slightly convex, moderately punctured; pronotum punctured; elytral punctures distinct . . . . **rotumanus**

3(1). Elytral intervals not raised; pronotum and elytron generally each uniformly pale or dark **4**

   Elytral intervals slightly costate; flavous, a median pronotal and sutural stripe of blackish . . . . . **costipennis**

4(3). Prothorax orange or yellowish; elytron entirely shiny blackish; abdomen black . . . . . **ruficollis**

   Pronotum pale; elytron with disc largely dark and borders pale; abdomen yellow . . . . . **leveri**

12. **Loxopleurus costipennis** Bryant

Loxopleurus costipennis Bryant, 1945, Ann. and Mag. Nat. Hist. Ser. 11, 12: 421, fig. 2 (Fiji; type in Brit. Mus.).

MALE: Flavous; last six antennal segments black and pubescent; pronotum with a median black stripe, broadest at anterior margin, gradually narrowing to a point at base; scutellum black; elytron with basal margin and suture narrowly black; ventral surfaces with fine golden pubescence, apical segment paler.

Head impunctate; eye strongly notched. *Antenna* reaching middle of elytron; scape longer than second and third segments combined. *Prothorax* with a very few fine scattered punctures and an oblique impression just behind middle of side. *Elytron* punctate-striate with intervals slightly costate.

FEMALE: Larger; black markings less well defined. Length: 2–2.5 mm.

VITI LEVU: Suva; type series taken by Lever. A male, Nandarivatu, Jan. 1955, Krauss; a male, Rewa, Feb. 1952, Gressitt.

LAU: One female, Loma Loma, Vanua Mbalavu I., Aug. 1938, Zimmerman, is tentatively referred here.

13. **Loxopleurus leveri** Bryant

Loxopleurus leveri Bryant, 1943, Ann. and Mag. Nat. Hist. Ser. 11, 10: 567 (Fiji; type in Brit. Mus.).

FEMALE: Testaceous; distal antennal segments brownish apically; elytral disc pitchy brown. *Head* feebly punctured on frons; eyes touching above. *Antenna* nearly three-fourths as long as body, slightly thickened distally. *Prothorax* nearly as broad as elytra, seven-ninths as long as broad, smooth and shiny; shallowly and obliquely grooved at side. *Elytron* feebly punctate-striate, with outer grooves more distinct. *Ventral surfaces* partly punctured at side. Length 2.65 mm.

LAU: Mvana, Vanua Mbalavu, Aug. 1938, beating shrubs, Zimmerman.

14. ***Loxopleurus ruficollis*** Bryant, n. sp.

Fig. 5

Black, the head, prothorax and legs rufous, prothorax nitid with a few scattered punc-

tures, elytron black, nitid, punctate-striate. Length 2.0–2.5 mm.

MALE: *Head* rufous, slightly rugose between antennal bases, eye reniform. *Antenna* extending almost to middle of elytron, seven basal segments flavous, apical four slightly fuscous, first segment slightly more dilated than second. *Prothorax* rufous, nitid, with a few scattered punctures, widest at base, side slightly contracted behind middle then slightly widening and contracted in front. *Scutellum* black, narrowly oblong, impunctate. *Elytron* black, nitid, punctate-striate, widest at base, gradually tapering to apex. *Underside* with prosternum rufous, abdominal sternites black, nitid. *Legs* flavous.

FEMALE: Differs in its slightly larger size, and a deep fovea in the apical ventral segment.

VITI LEVU: Holotype, male (BISHOP 2401), Korovou, Tailevu, Sept. 20, 1939, Valentine; allotopotype and one paratopotype (BISHOP, BM), same data. One female paratype, ridge west of Nandarivatu, Sept. 11, 1938, Zimmerman; another from Lami, Mar. 1951, Krauss.

LAU: One male, Vanua Mbalavu, Mvana, Aug. 9, 1938.

OVALAU: One male, Andubangda, July 15, 1938, Zimmerman.

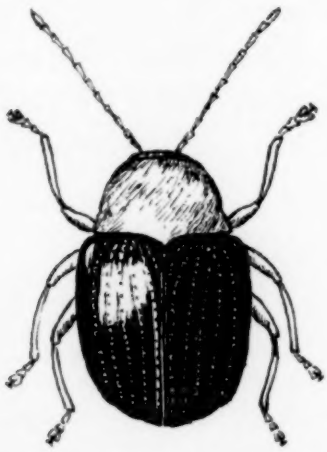

FIG. 5. *Loxopleurus ruficollis* Bryant, n. sp.

Somewhat allied to *L. leveri* Bry., but smaller, the color pattern is different, and the elytra are more strongly punctate-striate.

15. **Loxopleurus vitiensis** Bryant

Loxopleurus vitiensis Bryant, 1943, Ann. and Mag. Nat. Hist. Ser. 11, 10: 566.

MALE: Testaceous to reddish brown, variable; often with a broad reddish band across pronotal disc, a similar one across elytral base, and a narrower one behind middle of elytra. *Head* grossly punctured; eyes contiguous above. *Antenna* three-fourths as long as body, slightly flattened distally. *Prothorax* nearly as broad as elytra, smooth and shiny, with an oblique groove on side. *Elytron* feebly seriate-punctuate; last three rows more deeply punctured and slightly grooved. *Ventral surfaces* in part densely punctured. Length 2.6–2.9 mm.

FEMALE: *Antenna* three-fifths as long as body. Length 3–3.6 mm.

VITI LEVU: Mt. Victoria, west slope, Tholo North, Naivithula, Tailevu, Sept. 1937, Valentine; Tholo-i-suva, June 1924, Bryan and July 1938, Zimmerman; Nandarivatu, Sept. 1938, Zimmerman; Lami Quarry, July 1938, Zimmerman and May 1951, Krauss; near Suva, Feb. 1952, Gressitt.

16. ***Loxopleurus rotumanus*** Gressitt, n. sp.

Fig. 6

FEMALE: Testaceous; occiput pitchy; pronotum with a large central vaguely bordered pitchy area; scutellum ochraceous; elytron testaceous with basal, external, and apical margins broadly pitchy, and suture very narrowly reddish; ventral surfaces entirely pale except for posterior margins of first three abdominal sternites.

Head with a few punctures on frons, which is subtriangular and somewhat raised; eyes nearly touching above, each deeply emarginate near middle. *Antenna* three-fifths as long as body; last six segments slightly thickened; scape longer than second and third

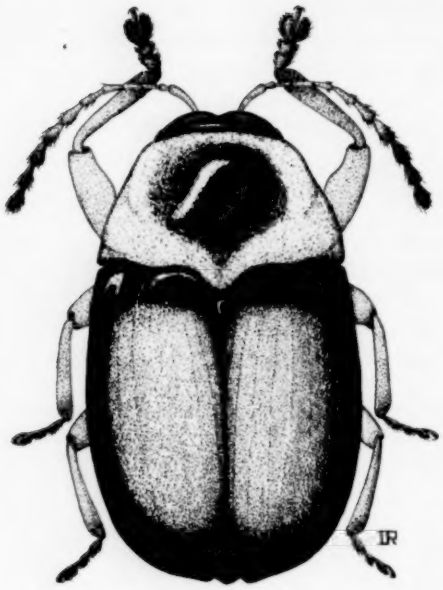

FIG. 6. *Loxopleurus rotumanus* Gressitt, n. sp.

segments combined; third distinctly longer than second or fourth. *Prothorax* nearly as broad as elytron, seven-ninths as long as broad, constricted, but not very distinctly collared, near apex; disc shiny, sparsely and shallowly punctured, obliquely grooved at side; median basal process emarginate. *Scutellum* suboblong, twice as long as broad, smooth. *Elytron* with ten rows of fine punctures, including sutural row, besides an oblique row between sixth and seventh regular rows; outer three rows in distinct grooves, the last two complete. *Ventral surfaces* in large part finely and not very closely punctured, and with short erect pale hairs; metepisternum finely rugulose; last abdominal sternite densely punctured except in the large central cavity. Length 3.5 mm.; breadth 2 mm.

ROTUMA: Holotype (BISHOP 2402) Jolmea, Rotuma Island, north of Fiji Islands, Aug. 13, 1938, H. St. John.

Differs from *L. vitiensis* Bryant in being stouter, with shorter antenna, more punctate pronotum and elytron, and with different markings, having the pronotum with a large central pitchy area and the elytron pale with broad dark borders except along suture.

17. **Cryptocephalus fraterculus** Chapuis

Cryptocephalus fraterculus Chapuis, 1876, Soc. Ent. de Belg., Ann. C. R. 18: XCI (Fiji).

This species was described from Fiji, but has not been identified from the material at hand.

Subfamily *EUMOLPINAE*

The study of the Fijian members of this subfamily has proved most difficult. To adapt the Fijian material to most of the previously used classifications would have required the erection of a number of new genera or tribes. On the basis of the material at hand, it would appear that many characters used in the past as tribal characters do not deserve that value. Therefore, a compromise has been made, which cannot be considered a final or satisfactory treatment, but one that may serve until the faunae of the island groups to the west are better known in this family. In the main, the system proposed by Chen (1940: 486 ff.) has been followed, though it does not quite satisfactorily solve the problem. It has involved a reduction from eight or more tribes to three. Some of the old tribal names are inserted in parentheses in the text.

KEY TO FIJIAN GENERA OF EUMOLPINAE

1. Apical tergite of abdomen with a median longitudinal groove; generally glabrous above; tarsal claws appendiculate; middle and hind tibiae not emarginate preapically (Colaspoidini) 2

   Apical tergite of abdomen lacking a median longitudinal groove; tarsal claws generally bifid; middle and hind tibiae generally emarginate preapically 3

2(1). Elytron regularly seriate-punctate; body just over one-half again as long as broad . . . . . **Eucolaspis**

Elytron irregularly punctured; body more than twice as long as broad. . . . . **Colaspoides**

3(1). Prothorax generally without distinct lateral margin, but if margined then dorsum is clothed with fine scales or hairs and also base of prothorax is much narrower than elytra (Adoxini) 4

Prothorax generally with a distinct lateral margin, but if unmargined then dorsum is generally glabrous (Nodinini) 6

4(3). Dorsum more or less pubescent, not exceedingly rough; legs not very long 5

Dorsum partly glabrous, exceedingly rough, with tubercles, nodes and heavy punctures; legs quite long. . . . . **Damelia**

5(4). Head narrower than prothorax; gena distinct; prothorax sometimes slightly margined at side; aedeagus more or less oblong, fairly broad. . . . . **Demotina**

Head as broad as prothorax, very short, with minute gena; prothorax unmargined at side; aedeagus slender and acuminate apically . . . . . **Parademotina**

6(3). Prothorax narrower than elytra, or dorsum more or less glabrous, or length more than 4 mm. 7

Prothorax practically as broad as elytra, distinctly margined; dorsum pubescent; body length less than 3 mm. . . . . **Stygnobia**

7(6). Prothorax nearly as broad as elytra, distinctly margined at side; dorsum generally glabrous, but rarely pubescent 8

Prothorax narrower than elytra, feebly margined or not margined at side; dorsum glabrous or with very fine indistinct hairs 9

8(7). Prothorax somewhat rounded anteriorly and rounded at side; elytron seriately or irregularly punctured; dorsum glabrous or pubescent. . . . . **Rhyparida**

Prothorax trapeziform, projecting at anterior corners; elytron seriate-punctate; dorsum glabrous . . . . . **Lindinia**

9(8). Scutellum normal 10
Scutellum transversely rectangular with prominent posterior angles. . . . . **Labasa**

10(9). Humerus not paricularly prominent; body less than 8 mm. long 11

Humerus prominent; body length 10 mm. or more . . . . . **Eurydemus**

11(10). Body narrow or elytra attenuated posteriorly; generally blackish and deeply punctured; some fine hairs on pronotum or elytron 12

Body not particularly narrow; varying in color, often partly pale; rarely very heavily punctured; dorsum glabrous . . . . . **Vitibia**

12(11). Elytra more or less attenuated posteriorly, not parallel-sided; elytron with fine subrecumbent hairs parallel to suture, and sometimes also with suberect hairs; pronotum glabrous . . . . . **Stethotes**

Body narrow, parallel-sided; elytron glabrous; pronotum finely and sparsely pubescent; head grooved above eye . . . . . **Epinodostoma**

Tribe NODININI
(METACHROMINI)

Genus LINDINIA Lefevre

Lindinia Lefevre, 1893, Soc. Ent. de France, Ann. 62(3). Bul. CCLXVI (type: *L. reflexoaenea* Lef.; Philippines).

Robust; head short, with frons transverse; antenna fairly slender; prothorax short, subrectangular; elytra a little broader than prothorax.

This genus is primarily Philippine.

18. ***Lindinia glabrata*** Bryant, n. sp.
Fig. 7

Glabrous, rufous, with the exception of fuscous tibiae and eight apical antennal segments; elytron very finely and feebly punctate-striate.

MALE: *Head* rufous and glabrous, a median longitudinal impression on vertex not extending to the base. *Antenna* extending to middle of elytron, three basal segments fulvous, the remainder fuscous, two basal segments more dilated, the third long and slender, about equal to the first two; third to fifth about equal; sixth to eleventh slightly thickened and more pubescent. *Prothorax* rufous and glabrous, widest at base, the sides feebly rounded and contracted in front. *Scutellum* rufous, impunctate, rounded at the apex. *Elytra* rufous, glabrous, but very finely and feebly punctate-striate, wider than base of prothorax, the sides parallel and beyond the middle rounded to apex. *Legs* rufous with tibiae slightly fuscous, intermediate and posterior pair emarginate at apex. Underside rufous and glabrous, first ventral segment of abdomen longest, second to the fourth shorter and equal to each other. Length 6 mm.

VITI LEVU: Holotype (BISHOP 2404) Navai Mill, near Nandarivatu, Viti Levu, Fiji, Sept. 17, 1938, 800 m., Zimmerman. One paratype, Nandarivatu, 1100 m., Sept. 5, 1938, Y. Kondo.

Closely allied to *L. tibialis* Lef., but differs in the less closely punctate striae, and in not having the legs and mesosternum black.

Genus RHYPARIDA Baly

Rhyparida Baly, 1861, Jour. Ent. 1: 286 (type: *R. dimidata* Baly; Australia).

Marsaeus Clark, 1864, Jour. Ent. 2: 252 (type: *Cryptocephalus didymus* Fabr.; Australia).

FIG. 7. *Lindinia glabrata* Bryant, n. sp.

Head short, generally grooved on occiput; prothorax subquadrate, often trapeziform or rounded at side; elytra only slightly broader than prothorax, seriate or rarely irregularly punctured. Generally glabrous above, but some Fijian species are pubescent. The last four species treated below may require a new genus.

This large genus is distributed in Madagascar, Mauritius, Ceylon, Indonesia, Philippines, and to the Carolines, Samoa, and Australia, but appears to be centered in the Papuan subregion.

KEY TO FIJIAN SPECIES OF *Rhyparida*

1. Length of body more than 5 mm. . . . 2

   Length of body less than 4 mm.; elytron regularly punctured 7

2(1). Dorsum glabrous; elytron more or less seriately punctured 3

   Dorsum pubescent; elytron closely and irregularly punctured . . . . . **luteola**

3(2). Pronotum rather densely punctured; elytron with puncture-rows somewhat irregular, very numerous and close, or punctures very large 4

Pronotum sparsely or very finely punctured; elytron with regular, widely spaced rows of fine punctures 5

4(3). Elytron with numerous, close, and slightly irregular puncture-rows; dorsum pitchy, slightly dull . . . . . **laddi**

Elytron with very large punctures in slightly irregular rows; dorsum bright reddish brown, shiny . . . . . **fijiensis**

5(3). Pronotum punctured, distinctly narrowed anteriorly; dorsum reddish to pitchy; elytron with interspaces somewhat convex 6

Pronotum impunctate, nearly as broad just behind apex as at base; dorsum shiny black, rarely reddish on elytron; elytral interspaces flat . . . **trapezicollis**

6(5). Reddish, with central portion of pronotal disc blackish; length of body less than 6 mm.; elytron less than three times as long as prothorax . . . . **dispar**

Pitchy black, slightly reddish on elytral bases; length of body more than 6.5 mm.; elytron more than three times as long as prothorax . . . . . **oblonga**

7(1). Pronotum finely pubescent 8
Pronotum glabrous, flat, closely vermiculate-punctate; elytron glabrous, shiny reddish . . . . . **vermiculata**

8(7). Elytron glabrous or very nearly so; pronotum smooth or longitudinally ridged between fine punctures 9

Elytron with minute scales or hairs; pronotum rather convex on disc, with dense punctures which are not arranged in longitudinal grooves; Lau I. . . . . **bryani**

9(8). Pronotal punctures largely in longitudinal or obliquely longitudinal grooves on side of disc; about 18 punctures in an approximate median longitudinal row; pronotal hairs fairly conspicuous; punctures in middle of second and third elytral rows separated transversely by spaces about three times as wide as punctures . . . . . **kandavu**

Pronotal punctures not in grooves; about 12 punctures in an approximate median longitudinal row; pronotal hairs rather inconspicuous; punctures in middle of second and third elytral rows separated transversely by spaces barely wider than their diameters . . . . . **strigosa**

19. **Rhyparida dispar** Bryant
Fig. 8*a*

Rhyparida dispar Bryant, 1925, Ann. and Mag. Nat. Hist. Ser. 9, 15: 593 (Labasa; type in Brit. Mus.).

Ochraceous-castaneous, middle portion of pronotum and an interrupted stripe on elytral

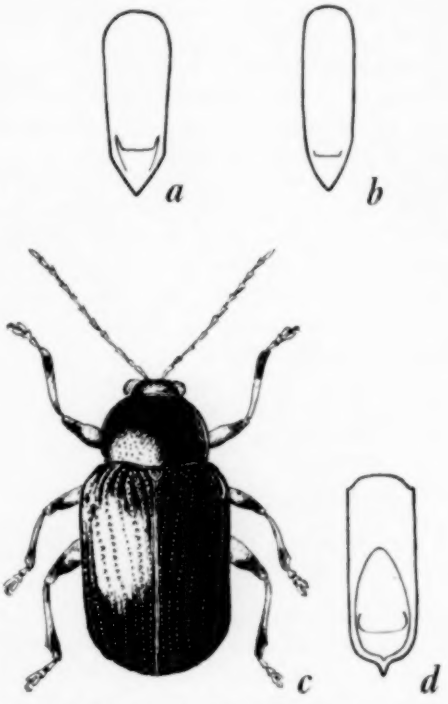

FIG. 8. *a*, *Rhyparida dispar*, aedeagus; *b*, *Rhyparida trapezicollis*, aedeagus; *c*, *Rhyparida oblonga* Bryant, n. sp.; *d*, *Rhyparida oblonga*, aedeagus.

disc pitchy. *Head* punctured throughout, grooved on occiput; *pronotum* moderately punctured, transverse; *elytron* deeply and regularly punctured. Length 4.5–5.7 mm.

VITI LEVU: Belt road west of Suva, July, Lami Quarry, near Suva, Aug., Mt. Korombamba, Aug., Nandarivatu, Sept. 1938, Zimmerman; Lami Quarry, Mar., May 1951, Krauss. Twelve specimens.

VANUA LEVU: Lambasa (type locality).

20. **Rhyparida trapezicollis** Fairmaire
Fig. 8*b*

Rhyparida trapezicollis Fairmaire, 1879, Le Naturaliste 1: 75 (Fiji); 1882, Soc. Ent. de France, Ann. Ser. 6, 1: 484 (Ovalau; type in Paris Mus.).

Shiny black; reddish on antenna, tarsi, and sometimes elytron; palpi testaceous. Body fairly glabrous, except on antenna and legs. *Head* wrinkled and punctured; *pronotum* very sparsely and feebly punctured; *elytron* seriate-punctuate, but with the punctures in part very widely spaced, and mostly disappearing in apical third. Length 4.3–4.5 mm.

VITI LEVU: Belt road, 60–75 km. west of Suva, July 1938, Cooke and Zimmerman; Tholo-i-suva, July, ridge west of Nandarivatu, Sept. 1938, Zimmerman; Bulu, near Suva, Apr., Vunindawa, May 1941, Krauss.

OVALAU: Near Vuma, July 1938, Kondo; Thawathi, July 1938, Zimmerman.

VANUA LEVU: Nakawanga, and between Navakuru and Nakawanga, on *Dillenia* sp., and between Nakawanga and Mbangata, Oct. 7–9, 1955, Gressitt.

HOST: *Dillenia biflora* (A. Gray) Martelli.

21. ***Rhyparida oblonga*** Bryant, n. sp.
Fig. 8*c*, *d*

Elongate, more or less piceous, head marked with fulvous near eye and clypeus, rugosely punctured, prothorax transverse, with anterior margin narrowly fulvous, not closely punctured, elytron piceous margined with fulvous.

Head with a triangular piceous patch at the base, and transversely piceous between the insertion of antenna, and narrowly fulvous near eye and clypeus, rugosely punctured. *Antenna* fulvous, long and slender, extending beyond middle of elytron, the two basal segments more dilated, first longer than second, third long and slender, about equal to first two together, fourth slightly longer than third, remainder all about equal. *Prothorax* transverse, widest behind the middle, contracted in front, strongly but not closely punctured, piceous, with anterior margin fulvous. *Scutellum* fulvous, impunctate, rounded at apex. *Elytron* elongate, wider at base than prothorax, a short depression below base; piceous, slightly metallic, with base and side margins narrowly fulvous, strongly punctate-striate. *Legs* fulvous, slightly darker at apex of tibiae, and middle of femora, tibiae pubescent, intermediate and posterior tibiae emarginate at apex. *Ventral surfaces* more or less piceous, coxae fulvous, and apical ventral segments of abdomen tinged with fulvous. Length 6–7 mm.

VITI LEVU: Holotype (BISHOP 2405) Vatuthere, 800 m., Sept. 1938, under bark, Zimmerman; twelve paratopotypes, same data; one, Nandarivatu, Sept. 1938, Zimmerman. One taken under bark of *Agathis* sp. (kauri pine).

Differs from *R. dispar* Bryant in being larger, darker, with dorsum more deeply and closely punctured.

22. ***Rhyparida fijiensis*** Gressitt, n. sp.
Fig. 9

FEMALE: Reddish castaneous, ochraceous beneath and on antenna; pronotum with some small apparent blackish (transparent) spots. Antenna and legs with some short and some long oblique goldish hairs; ventral surfaces nearly glabrous.

Head distinctly punctured; frons subtriangular; vertex depressed; occiput feebly grooved. *Antenna* nearly three-fourths as long as body, slender; second segment two-thirds

FIG. 9. *Rhyparida fijiensis* Gressitt, n. sp.

as long as scape; third nearly as long as scape; fourth longer than scape; fifth and following subequal. *Prothorax* five-sevenths as long as broad, convex in outline on four sides, somewhat narrower at apex than at base; disc rather coarsely punctured, somewhat closely so at side. *Scutellum* as long as broad, parallel-sided, rounded behind. *Elytron* slightly broadened to behind middle, then narrowed; disc coarsely punctured, almost foveate-punctate, in somewhat irregular, more or less complete, rows, the punctures mostly rather widely spaced. *Ventral surfaces* shiny and impunctate on metasternum, feebly punctured, punctulate, or wrinkled on metepisternum and abdomen. *Femora* not toothed. Length 6.7 mm.; breadth 3.6 mm.

VITI LEVU: Holotype, female (BISHOP 2406), Tholo-i-suva, 150 m., Aug. 25, 1938, Zimmerman, taken by beating shrubs.

Differs from *R. dispar* Bryant in being larger, more heavily and less regularly punctured, and more uniformly colored.

23. ***Rhyparida laddi*** Gressitt, n. sp.

FEMALE: Pitchy reddish brown, more reddish on elytron, ventral surfaces and legs, but darker on occiput, pronotum, parts of tibiae, and apices of femora. Body glabrous except for a few minute hairs on ventral surfaces; antenna and legs with some oblique or suberect pale hairs.

Head distinctly narrower than prothorax, about as wide as deep, finely and closely punctured except along median line of occiput behind center. *Antenna* two-thirds as long as body, slender; scape barely thickened, twice as long as second segment; third slightly longer than second; fourth slightly longer than scape, and slightly longer than fifth; sixth and following subequal, each not quite as long as fourth. *Prothorax* one-half as long as broad, not quite three-fourths as broad as elytra, distinctly rounded at side, narrower at apex than at base, broadest slightly behind center; disc moderately convex, finely and irregularly punctured with at least 15 punctures in an approximate mid-longitudinal row; interspaces between punctures somewhat raised, giving an uneven appearance. *Scutellum* longer than broad, rounded apically. *Elytron* nearly three times as long as prothorax, parallel-sided in basal two-thirds, evenly rounded with its fellow apically; disc punctured in about 19 rows at middle, the rows in part regular and in part irregular or unevenly spaced, with extra rows near scutellum and below humerus; disc swollen along hypothetical humeral ridge almost to apex. *Ventral surfaces* apparently impunctate. Length 5.7 mm.; breadth 3.65 mm.

VITI LEVU: Holotype, female (BISHOP 2407), above Matainanu, alt. 125 m., northeast coast of Viti Levu I., June 17, 1928, H. S. Ladd.

Differs from *R. luteola* Fairmaire in being glabrous above, in having the elytral punctures arranged in moderately regular rows and not nearly so dense and numerous, and with the pronotum also much less closely punctured.

24. **Rhyparida luteola** Fairmaire
Fig. 10*a*

Rhyparida luteola Fairmaire, 1879, Le Naturaliste 1: 75 (Fiji; type in Paris Mus.); 1882 Soc. Ent. de France, Ann. Ser. 6, 1: 434.

Reddish brown, some vague pitchy lines on pronotum; elytron pitchy brown except for reddish base; dorsum with rather close golden brown hairs. Head rugose-punctate; pronotum densely punctured; elytron closely punctured. Length 4.4–6.1 mm.

VITI LEVU: Belt road 32 km. west of Suva, July, Tholo-i-suva, July, Mt. Korombamba, Aug., ridge west of Nandarivatu, Sept. 1938, Zimmerman; Lami, Apr. 1951, Krauss, 28 specimens.

VANUA LEVU: Nakawanga, Oct. 8, 1955, Gressitt, five specimens, on *Couthovia*.

HOST: *Couthovia corynocarpa* A. Gray.

25. ***Rhyparida vermiculata*** Gressitt, n. sp.
Fig. 10*b*

MALE: Dark castaneous brown, pitchy black on pronotum. Body glabrous above.

Head fully four-fifths as broad as prothorax, as broad as deep, somewhat finely and closely punctured, distinctly striate on occiput. *Antenna* fairly slender, four-fifths as long as body; scape a little longer than second segment; third a little longer than second, subequal to fifth and sixth, shorter than fourth; seventh and following barely longer than fourth. *Prothorax* a little broader than long, a little narrower than elytra, distinctly rounded at side; disc very closely vermiculate-punctate, the anterior portion for most part longitudinally striate-punctate. *Scutellum* a little longer than broad, rounded behind, with a pair of punctures. *Elytron* more than twice as long as prothorax, moderately narrowed posteriorly; disc with 11 regular rows of fairly deep punctures, and two extra scutellar rows; some of basal punctures separated by hardly more than equivalent of their diameters, but much smaller posteriorly. *Metasternum* very sparsely punctured; abdomen finely punctured. Length 3.2 mm.; breadth 1.6 mm.

FIG. 10. *a*, *Rhyparida luteola*, aedeagus; *b*, *Rhyparida vermiculata* Gressitt, n. sp., aedeagus; *c*, *Rhyparida kandavu* Gressitt, n. sp., aedeagus; *d*, *Rhyparida strigosa*, aedeagus; *e*, *Rhyparida bryani* Gressitt, n. sp., aedeagus.

LAU: Holotype, male (BISHOP 2408), Tuvutha I., northern Lau Group, Sept. 11, 1924, Bryan.

Differs from *R. dispar* Bryant in being much smaller, with the pronotum flat and densely vermiculate.

26. ***Rhyparida kandavu*** Gressitt, n. sp.
Fig. 10*c*

MALE: Pale castaneous brown with basal third of pronotum blackish; ventral surfaces reddish to pitchy; antenna pale in basal half, slightly pitchy in distal half. Pronotum finely pubescent; elytron apparently glabrous.

Head seven-tenths as broad as prothorax, slightly deeper than wide, strongly swollen above, finely and not very closely punctured on frons, strigose-punctate on occiput. *Antenna* two-thirds as long as body, moderately thickened distally; scape a little longer than second segment; third nearly as long as scape, slightly shorter than fourth; fifth as long as fourth, slightly longer than sixth; seventh and following subequal, each thickened distally and barely longer than fifth. *Prothorax* just over three-fourths as long as broad, nearly three-fourths as broad as elytra, distinctly rounded at side, slightly narrower at apex than at base, strongly rounded-convex at anterior margin, obtusely convex at basal margin; disc flattened in central portion which has narrow longitudinal punctures which are narrower than spaces between them; punctures on side of disc mostly rather close and

in obliquely longitudinal grooves. *Scutellum* slightly longer than broad, rounded apically. *Elytron* somewhat convex externally, broadest at middle, evenly curved posteriorly; disc with 11 distinct rows of punctures at middle and an extra scutellar and extra subhumeral row; punctures fairly large near humerus, but much smaller than interspaces along suture and on apical portion. *Ventral surfaces* strongly punctured on metasternum and finely punctured on abdomen. Length 3.1 mm.; breadth 1.3 mm.

PARATYPES: Varying from entirely reddish brown to pitchy black tinged in spots with reddish. Length 2.4–2.9 mm.; breadth 1.2–1.5 mm.

KANDAVU: Holotype, male (BISHOP 2409), Yawi, Apr. 28, 1941, Krauss; allotopotype, female (BISHOP), same data. Nine paratopotypes (BISHOP, BM, USNM, CSIRO), same data. Eleven paratypes, Vambea, Ono I., Kandavu Group, Apr. 30, 1941, Krauss.

Differs from *R. vermiculata* Gressitt in being smaller, in having shorter legs, in having the pronotum partly strigose and partly sparsely punctured, instead of entirely vermiculate, and the elytron with only one extra scutellar row of punctures.

27. ***Rhyparida strigosa*** (Bryant) new comb.
Fig. 10*d*

Nodostoma strigosa Bryant, 1945, Ann. and Mag. Nat. Hist. Ser. 11, 12: 424, fig. 6 (Tamavua; type in Brit. Mus.).

Black, metallic; anterior margin of prothorax narrowly fulvous; antenna with first six segments flavous and remainder fulvous; tibiae and tarsi fulvous. *Head* strigose; *antenna* slender, with third to sixth segments subequal; *prothorax* with side rounded basally and slightly contracted in front, strongly but not closely punctured; *elytron* strongly punctate-striate, the punctures stronger than on pronotum; *mesosternum* with a few strong punctures; first abdominal sternite twice as long as second. Length 3 mm.

VITI LEVU: Tamavua (type locality). Six from Bulu, near Sovi, Apr. 21, 1941, Krauss.

One reddish female specimen from Naroi, Moala I. (Aug. 24, 1938, Zimmerman) is close to this species, but probably represents a different race.

28. ***Rhyparida bryani*** Gressitt, n. sp.
Fig. 10*e*

MALE: Pitchy black, somewhat reddish on base and side of elytron, antenna, fore part of head, ventral surfaces, and legs. Pronotum with indistinct fine recumbent hairs; elytron with sparse minute scale and a few minute suberect hairs.

Head just over three-fourths as broad as prothorax, fully as broad as deep, finely and not very closely punctured on frons, somewhat densely substrigose-punctate on occiput, slightly grooved above eye. *Antenna* just over one-half as long as body, moderately stout distally; scape stout, a little longer than second segment and considerably thicker; third subequal to second and fifth, slightly longer than sixth and slightly shorter than fourth; seventh and following about as long as third, but much stouter. *Prothorax* just over three-fourths as long as broad, nearly three-fourths as broad as elytra, distinctly rounded at side, slightly narrower at apex than at base, convex apically and basally; disc convex, deeply impressed with longitudinal punctures which are mostly about as wide as interspaces, with roughly 15 in an approximate mid-longitudinal row. *Scutellum* pentagonal, slightly longer than broad, narrowed from base. *Elytron* just over twice as long as prothorax, subparallel-sided in basal two-thirds; disc deeply punctured in 12 regular rows at middle, with two extra scutellar rows, the interstices somewhat raised, and mostly about as wide as the punctures. *Ventral surfaces* punctured along margin of metasternum and vaguely punctured on abdomen. Length 2.3 mm.; breadth 1.3 mm.

PARATYPES: Sometimes entirely black ex-

cept for antenna and legs. Length 2.1–2.6 mm.; breadth 1.2–1.4 mm.

LAU: Holotype, male (BISHOP 2410), Fulanga I., southern Lau Group, Aug. 5, 1924, E. H. Bryan, Jr.; allotype, female (BISHOP), Ongea I. (Ogea Levu), southern Lau Group, July 21, 1924, Bryan. Four paratypes (BISHOP, BM), Tuvutha I., Sept. 10, and Namuka I., Aug. 12, 1924, Bryan. Named for the collector, who is Curator of Collections at Bishop Museum.

Differs from *R. strigosa* (Bryant) in having the pronotal puncturation much denser, the elytral puncturation somewhat denser, with the interspaces narrower and more raised, with two instead of one extra scutellar row, and with the elytron having fine scales instead of being glabrous.

Genus LABASA Bryant

Labasa Bryant, 1925, Ann. and Mag. Nat. Hist. Ser. 9, 15: 592 (type: *L. scutellaris* Bryant; Fiji).

Rather similar to *Rhyparida*, but scutellum highly transverse and angular; head rugose-punctate; pronotum grossly punctured; elytron subcostate basally. Endemic.

29. **Labasa scutellaris** Bryant

Labasa scutellaris Bryant, 1925, Ann. and Mag. Nat. Hist. Ser. 9, 15: 592 (Labasa; type in Brit. Mus.).

Pitchy to blackish or ochraceous; mostly dark, with antennal base, parts of legs, and some of basal elytral costae ochraceous; elytral puncture-rows nearly complete, the punctures weaker posteriorly. Length 5–6 mm.

VITI LEVU: Nandarivatu, Navai Mill, Oct. 1937, Valentine; Nandala, Mar. 1941, Degener; Nandarivatu, Aug. 1938, Zimmerman.

VANUA LEVU: Lambasa (type locality). Nakawanga, on *Pipturus*, *Merremia*, and *Trichospermum*, Oct. 8–9, 1955, Gressitt; Nakawanga to Mbangata, Oct. 9, Gressitt.

HOSTS: *Pipturus argenteus* var. *lanosus* Skottsb.; *Merremia peltata* (L.) Merr.; *Trichospermum calyculatum* (Seem.) Burret.

Genus VITIBIA Fairmaire

Vitibia Fairmaire, 1882, Soc. Ent. de France, Ann. Ser. 6, 1: 485 (type: *V. rufoviolacea* Fairm.; Fiji).

Antenna more than one-half as long as body, segments subequal except for second. Prothorax much narrower than elytra, quadrate, very narrowly margined. Elytron seriate-punctate basally, the rows disappearing on postmedian portion. Femora unarmed, clavate; tibiae emarginate preapically. Probably some of the following species do not truly belong in this genus.

KEY TO FIJIAN SPECIES OF *Vitibia*

1. Length over 5 mm.; elytra metallic; prothorax red 2
   Length under 4 mm.; elytra testaceous to black; prothorax testaceous to pitchy brown 3
2(1). Elytra metallic green . . . . . **formosa**
   Elytra violaceous, golden green distally . . . . . **rufoviolacea**
3(1). Prothorax about as long as broad, at least in male 4
   Prothorax distinctly broader than long in both sexes 7
4(3). Prothorax dark, metallic; elytron submetallic, greenish to pitchy 5
   Prothorax pale or largely pale; elytron pale to partly brownish 6
5(4). Punctures on center of pronotum almost as large as interspaces, and approximately likewise for elytron; elytron more than one and one-half times as long as broad . . . . **pallipes**
   Punctures on center of pronotum about one-third as large as interspaces, and approximately likewise for elytron; elytron barely one and one-half times as long as broad . . . . . **virida**
6(4). Frons and vertex distinctly concave; elytron somewhat carinate and ver-

tical laterally, particularly in female; pronotum generally with a longitudinal dark stripe; elytra darkened posteriorly . . . . . **dimorpha**

Frons and vertex flat; elytron not carinate and vertical at side; pronotum and elytron uniformly pale . . . . . **testacea**

7(3). Frontoclypeus almost impunctate, sometimes with one or two large punctures; prothorax narrowed anteriorly, broadest behind middle, or suture darkened; pronotum with punctures of moderate size; testaceous to pitchy with a slight bronzy tinge **8**

Frontoclypeus distinctly punctured; prothorax often symmetrical anteroposteriorly, broadest in middle; ochraceous to greenish pitchy **10**

8(7). Prothorax broadest slightly behind middle; terminal portion of aedeagus somewhat gradually tapering **9**

Prothorax broadest at middle; terminal portion of aedeagus rather suddenly narrowed; body pale with suture darkened . . . . . **striatipennis**

9(8). About eight punctures in an approximate mid-longitudinal row on pronotum; female without a sharp humeral carina on elytron; male pale; female bronzy brown, darkened on side of elytron, and slightly so on suture . . . . . **montana**

About 12 punctures in an approximate mid-longitudinal row on pronotum; female with a sharp humeral carina on elytron; male pale; female dark, often pale only on base and apex of elytron, but sometimes also along middle . . . . . **greenwoodi**

10(7). Prothorax evenly rounded at side, widest in middle, symmetrical antero-posteriorly **11**

Prothorax not symmetrical anteroposteriorly, widest behind middle **13**

11(10). Pronotal punctures exceedingly fine, separated by spaces several times as wide as punctures **12**

Pronotal punctures moderate, separated by spaces often not much greater than width of punctures; pale, with darkened suture . . . . . **striatipennis**

12(11). Elytral punctures quite uneven in size, and partly in uneven rows, rarely extending beyond middle; scutellum subpentagonal; aedeagus of male blunt apically . . . . . **vitiensis**

Elytral punctures somewhat even and subregular, often extending beyond middle; scutellum subrounded apically; aedeagus of male acuminate apically . . . . . **melochiae**

13(10). Pronotal punctures moderately fine to strong; pronotum not broadest very near base in male; length less than 2.7 mm **14**

Pronotal punctures very minute and very widely spaced; pronotum broadest very near base in male, considerably tapered anteriorly; length more than 2.8 mm.; male ochraceous; female darker along middle of elytral disc . . . . . **bryanti**

14(13). Pronotum moderately punctured, less than 10 punctures in an approximate mid-longitudinal row; color pale to partly greenish pitchy **15**

Pronotum heavily punctured, at least 12 punctures in an approximate mid-longitudinal row; dorsum pitchy brown to blackish, paler only on front of head and base of elytron, generally darker on pronotum . . . . . **rufilabris**

15(14). Pronotal punctures fine, mostly one-third to one-fourth as wide as inter-

spaces; dorsum partly greenish bronzy, at least across center of pronotum and on parts of elytron . . . **16**

Pronotal punctures moderate, mostly one-half as wide to nearly as wide as interspaces; dorsum pale except for suture which is sometimes slightly darkened; orifice of aedeagus twice as long as broad . . . **duplicata**

16(15). Largely pale, with slight darkening on pronotum and elytron; elytral punctures not entirely minute behind middle . . . . . **obscura obscura**

Largely metallic green, with pale areas on apex and base of pronotum and with a parasutural pale stripe on elytron from base to apex; elytral punctures minute behind middle . . . . . **obscura submetallica**

30. **Vitibia formosa** (Baly)

Fig. 11*a*

Rhyparida formosa Baly, 1877, Ent. Soc. London, Trans. 1877: 40 (New Hebrides; type in Brit. Mus.).

Vitibia formosa Fairmaire, 1882, Soc. Ent. de France, Ann. Ser. 6, 1: 485.

Bright ochraceous red, paler on legs and ventral surfaces; elytron metallic green; antenna black beyond fourth segment. Head feebly punctured; prothorax feebly punctured; elytron with rows of moderate punctures which disappear on posterior portion of disc. Length 5–6.2 mm.

VITI LEVU: Londoni, Tailevu, Aug. 1937, Valentine.

OVALAU: Levuka, Nov. 1937, Valentine.

KANDAVU: Yawi, Apr. 1941, Krauss, six specimens.

NEW HEBRIDES.

HOST: On leaf of *Excoecaria agallocha* L., after Lever; *Thespesia populnea* (L.) Sol, after Valentine.

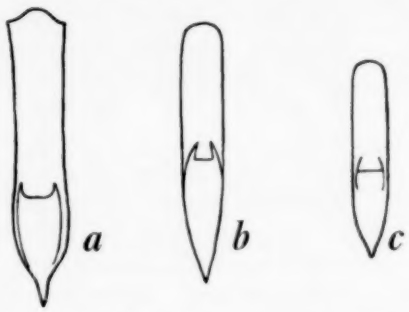

FIG. 11. *a*, *Vitibia formosa*, aedeagus; *b*, *Vitibia montana* Gressitt, n. sp., aedeagus; *c*, *Vitibia greenwoodi*, aedeagus.

31. **Vitibia rufoviolacea** Fairmaire

Vitibia rufoviolacea Fairmaire, 1882, Soc. Ent. de France, Ann. Ser. 6, 1: 485 (Viti; type in Paris Mus.).

Reddish testaceous, shiny; elytra violaceous, metallic greenish apically; antenna brownish with first three and base of fourth testaceous. Prothorax finely and sparsely punctured; elytron finely and irregularly punctured posteriorly. Length 6 mm.

FIJI: Described from "Iles Viti." No material is at hand; possibly this is the same as the preceding.

32. ***Vitibia montana*** Gressitt, n. sp.

Fig. 11*b*

MALE: Testaceous, slightly darker on suture in basal third; distal portion of last five antennal segments pitchy; parts of thoracic pleura and ventral hind margin of prothorax pitchy brown. Ventral surfaces and legs with a few scattered pale hairs.

Head nearly six-sevenths as broad as prothorax, about as deep as wide, almost impunctate. *Antenna* five-sevenths as long as body; scape one-half again as long as second segment; third as long as second; fourth as long as scape, subequal to fifth and sixth; seventh to last longer, subequal. *Prothorax* nearly seven-eighths as long as broad, just over five-eighths as broad as elytra, somewhat

evenly rounded at side, not much narrower at apex than at base; disc convex, unevenly impressed with punctures of moderate size, coarser at side. *Scutellum* narrow, rounded apically. *Elytron* broadly rounded, widest slightly anterior to middle; disc impressed with about 10 rows of moderate to strong punctures at middle, mostly one-half to one-third as wide as interspaces, but becoming suddenly minute behind basal three-fifths. *Ventral surfaces* punctured along anterior border of metasternum; abdomen minutely rugulose-punctate. Length 2.3 mm.; breadth 1.2 mm.

FEMALE: More reddish, slightly tinged with pitchy along suture and outer margin of elytron, and on metasternum. Length 2.7 mm.; breadth 1.43 mm.

PARATYPES: Length 2.2–2.8 mm.; breadth 1.14–1.5 mm.

VITI LEVU: Holotype, male (BISHOP 2411), Nandarivatu, 1100 m., beating, Sept. 3, 1938, Zimmerman; allotopotype, female (BISHOP), Sept. 5. Eight paratypes (BISHOP, BM, US): five paratopotypes, Sept. 6–10; two Navai-Nasonga trail, 800 m., Sept. 12, 1938, Zimmerman; one Navai Mill, Oct. 13, 1937, Valentine.

Differs from *V. greenwoodi* (Bryant) in being paler, the punctures more regular to behind middle, the elytron not carinate in female, and in the aedeagus tapering gradually to an acute apex instead of narrowing somewhat suddenly before the blunt apex.

33. *Vitibia greenwoodi* (Bryant), n. comb.

Fig. 11*c*

Nodostoma greenwoodi Bryant, 1945, Ann. and Mag. Nat. Hist. Ser. 11, 12: 421, fig. 4 (Lautoka; type in Brit. Mus.).

Nitid; head fulvous; prothorax black with anterior margin broadly fulvous; elytron black with base fulvous; antenna and legs flavous. *Head* impunctate; *antenna* slender, with scape twice as long as second segment, and next three slender and subequal; *prothorax* transverse, slightly rounded at side, strongly but not closely punctured; *scutellum* triangular; *elytron* impressed near humerus, strongly punctate-striate, the punctures rather wide apart, the intervals between the striae at side slightly costate. Length 2.5 mm.

VITI LEVU: Lautoka (type locality). Twelve, Navai-Nasonga trail, 800 m., Sept. 12, 1938, Zimmerman; two, Navai Mill, Nandarivatu, Oct. 13, 1937, Valentine.

OVALAU: One, Andubangda, 450 m., July 15, 1938, Zimmerman.

34. *Vitibia striatipennis* Bryant, n. sp.

Fig. 12*a*, *b*

Flavous, seven apical segments of antenna fuscous; elytron with suture and side margin narrowly black, and from shoulder a faint fuscous stria parallel with side margin.

Head flavous, impunctate, a short longitudinal impression between bases of antennae, eye large and prominent. *Antenna* long and slender, extending to middle of elytron; first segment longest and more dilated, about twice as long as second; seven apical segments tinged with fuscous. *Prothorax* flavous, somewhat nitid, with large scattered punctures; side rounded; very slightly broader than long. *Scutellum* triangular, impunctate, fuscous. *Elytron* elongate, rounded at apex, flavous; suture and side margin narrowly black, and from shoulder a faint fuscous stria running parallel to side margin; punctate-striate, the punctures large and widely spaced. *Legs* flavous, middle and posterior pair emarginate at apex of tibia. *Underside* flavous, ventral segments of abdomen with scattered golden pubescence. Length 2.4 mm.; breadth 1.1 mm.

VITI LEVU: Holotype (BISHOP 2412), Nandarivatu, Tholo North, Oct. 18, 1937, Valentine; two specimens. Nandarivatu, 1100 m., Sept. 6, and ridge west of Nandarivatu, 800 m., Sept. 11, 1938, Zimmerman; two specimens. One, Lautoka, Mar. 1955, Krauss.

A very distinct species, its elongate shape somewhat allied to *V. pallipes* Bry.

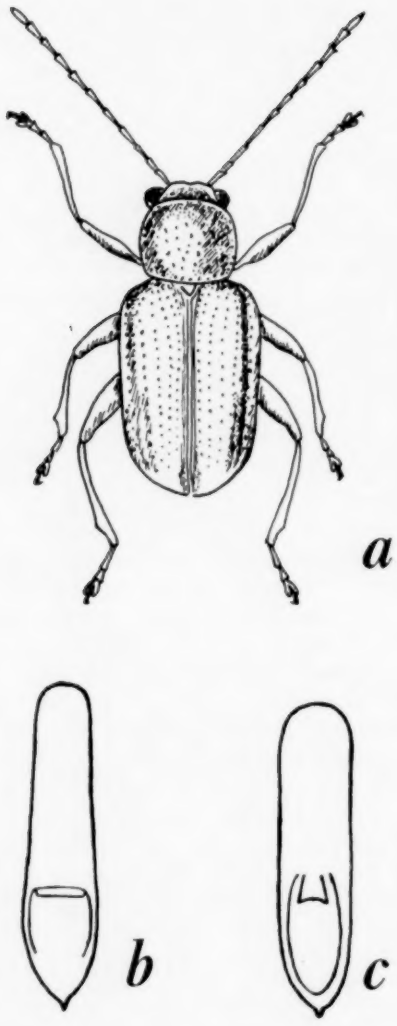

FIG. 12. *a*, *Vitibia striatipennis* Bryant, n. sp., adult; *b*, *Vitibia striatipennis*, aedeagus; *c*, *Vitibia vitiensis*, aedeagus.

35. ***Vitibia vitiensis*** (Bryant), n. comb.

Fig. 12*c*

Nodostoma vitiensis Bryant, 1942, Ann. and Mag. Nat. Hist. Ser. 11, 9: 512 (Taveuni, Suva; type in Brit. Mus.).

Fulvous; apical half each of last five antennal segments fuscous; elytron entirely fulvous or with varying degrees of black markings, which do not reach humerus or apex. *Head* impunctate; *antenna* with scape longer and more swollen than second segment, second to sixth slender and subequal, and seventh to last thicker and subequal; *prothorax* slightly transverse, rounded at side, with a few irregular punctures; *scutellum* triangular; *elytron* with basal half strongly but irregularly punctured in irregular striae, and apical half nearly impunctate; *abdominal sternites* finely punctured. Length 3 mm.

VITI LEVU: Suva. One, Tholo-i-suva, 150 m., July 25, 1938, Zimmerman; one, Nayavu, Mar. 1951, Krauss.

TAVEUNI: (Type locality.)

MOALA: July 13, 1924, Bryan.

LAU: Vanua Mbalavu I., Sept. 23, 1924, Bryan; Mvava, Vanua Mbalavu, at seashore, Aug. 9, 1938, Zimmerman; Munia I., Aug. 3, 1938, Zimmerman; Mothe I., Aug. 14–16, 1924, Bryan.

HOST: *Gossypium* (cotton).

36. ***Vitibia melochiae*** Gressitt, n. sp.

Fig. 13*a*, *b*

MALE: Pale testaceous, slightly reddish behind eye and on mouth parts. Ventral surfaces and legs with sparse fine pale hairs.

Head nine-tenths as broad as prothorax, about as wide as deep, moderately punctured in middle; occiput finely grooved anteriorly, nearly impunctate. *Antenna* slender, three-fourths as long as body; scape nearly one-half again as long as second segment, subequal to third, fourth, and fifth; sixth slightly longer; seventh to last subequal, each slightly longer than sixth. *Prothorax* nearly six-sevenths as long as broad, two-thirds as broad as elytra, subevenly rounded at side, narrower at apex than at base, widest slightly behind middle; disc subfinely and unevenly punctured, most of punctures about one-third as large as interspaces. *Scutellum* as long as broad, obtuse

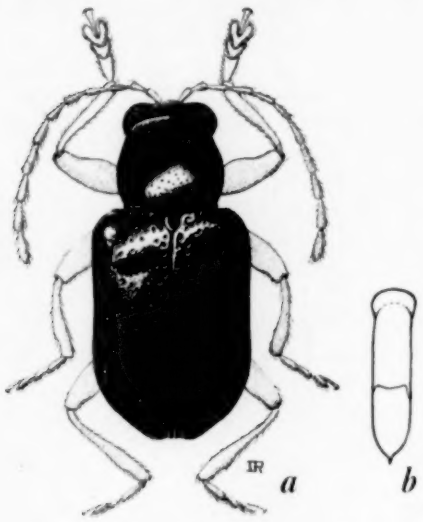

FIG. 13. *a*, *Vitibia melochiae* Gressitt, n. sp., type; *b*, *Vitibia melochiae*, aedeagus.

apically. *Elytron* subparallel-sided in basal two-thirds; disc subregularly punctured in about nine rows, the punctures irregular in size, mostly about two-thirds as wide as interspaces, much smaller in apical third. *Ventral surfaces* nearly impunctate. Length 2.3 mm.; breadth 1.15 mm.

FEMALE: Abdomen pitchy on first four segments. Length 2.6 mm.; breadth 1.4 mm.

PARATYPES: Length 2.3–2.6 mm.; breadth 1.3–1.6 mm.

VANUA LEVU: Holotype, male (BISHOP 2413), Nakawanga, 75 m., on *Melochia*, Oct. 8, 1955, Gressitt; allotopotype, female (BISHOP), same data; 22 paratopotypes, (BISHOP, BM, US, CSIRO, CAS), same data.

VITI LEVU: Two, Korovou, Tailevu, Sept. 20, 1937, Valentine; one, Mt. Victoria, 900 m., Sept. 16, 1938, Zimmerman; one, Nandarivatu, 1100 m., Sept. 6, 1938, Zimmerman; one, Tholo-i-suva (Colo-i-suva), June 21, 1924, Bryan; one, Lautoka, Mar. 1955, Krauss.

KANDAVU: One, Drue, Apr. 20, 1941, Krauss.

HOST: *Melochia vitiensis* A. Gray.

Differs from *V. vitiensis* (Bryant) in being slightly smaller, paler, with the pronotal punctures slightly finer, the elytral punctures more regular and continuing farther posteriorly, and the aedeagus more suddenly narrowed before apex.

37. *Vitibia duplicata* Gressitt, n. sp.
Fig. 14*a*

MALE: Ochraceous, hyaline; legs and antenna testaceous, latter with apices of distal segments slightly darkened. Ventral surfaces and appendages with sparse pale suberect hairs.

Head nine-tenths as broad as prothorax, as wide as deep, moderately punctured at middle; occiput finely grooved anteriorly and minutely punctured; gena short. *Antenna* nearly five-sixths as long as body; scape one-third again as long as second segment; third subequal in length to second, distinctly shorter than fourth; fourth to sixth subequal; seventh and following slightly longer, subequal. *Prothorax* six-sevenths as long as broad, just over seven-tenths as broad as elytra, rounded at side, distinctly narrowed anteriorly, widest well behind middle; disc convex, irregularly punctured, the interspaces one to three times as wide as punctures. *Scutellum* short, rounded

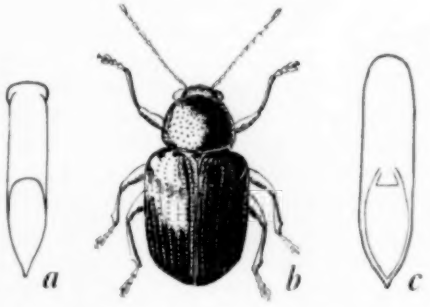

FIG. 14. *a*, *Vitibia duplicata* Gressitt, n. sp., aedeagus; *b*, *Vitibia rufilabris* Bryant, n. sp., type; *c*, *Vitibia rufilabris*, aedeagus.

behind. *Elytron* narrow, subparallel in basal two-thirds; disc punctured in about nine rows, the punctures unequal in size, interspaces from one to three times as wide as punctures, which disappear in apical third. *Ventral surfaces* and appendages with sparse suberect pale hairs. Length 2.3 mm.; breadth 1.1 mm.

PARATYPES: Some slightly reddish, or slightly darkened along suture. Length 2.25–2.5 mm.; breadth 1.1–1.28 mm.

VITI LEVU: Holotype, male (BISHOP 2414), Tholo-i-suva (Colo-i-suva), June 21, 1924, E. H. Bryan, Jr. Four paratypes: Nandarivatu, 1100 m., Sept. 3, Navai-Nasonga trail, west slope, 800 m., Sept. 12, 1938, Zimmerman, and Mt. Victoria, 1100 m., Sept. 10, 1938, Kondo.

Differs from *V. vitiensis* (Bryant) in having the pronotum more narrowed anteriorly more heavily punctured, the elytron punctured farther posteriorly, and the aedeagus being more gradually narrowed and acuminate apically.

38. ***Vitibia rufilabris*** Bryant, n. sp.
Fig. 14*b*, *c*

Shining black; labrum, base of antenna, and legs more or less rufous. Prothorax strongly punctured; elytron more finely punctate-striate.

Head and labrum more or less rufous, a few very strong punctures between bases of antennae; basal portion of head impunctate. *Antenna* extending to middle of elytron; basal segments rufous; five apical segments fuscous, each with basal portion fulvous. *Prothorax* shining black strongly punctured; side rounded. *Scutellum* black, nitid, triangular, impunctate. *Elytron* shining black, wider than base of prothorax, sides parallel and rounded to the apex, more finely punctate-striate, becoming almost impunctate towards apex. *Legs* more or less rufous, tarsi paler, middle and posterior tibiae emarginate near apex. *Underside* with the ventral segments of the abdomen fulvous and impunctate. Length 3 mm.

VITI LEVU: Holotype (BISHOP 2415), Nandarivatu, 600 m., Sept. 1, 1938, Zimmerman. Three paratypes: Nandarivatu, Sept. 5, Zimmerman; Nandarivatu, Oct. 18, 1937, Valentine; ridge west of Nandarivatu, 800 m., Sept. 9, 1938, Zimmerman.

Somewhat similar to *R. strigosa* (Bryant), but with no trace of pubescence, and the puncturation of the prothorax much stronger, and the punctate-striae of the elytron much finer.

39. ***Vitibia obscura obscura*** Gressitt, n. sp.
Fig. 15*a*, *b*

Dull testaceous to bronzy pitchy, in part paler; head bronzy pitchy, paler on frons; antenna pitchy brown, testaceous on first four segments; pronotum bronzy pitchy, somewhat paler basally and on anterior margin; elytron dull brown, paler behind humerus, darker on margin and blackish along suture; ventral surfaces reddish brown, darker on metasternum; legs testaceous. Antenna, legs, and distal portion of abdomen moderately clothed with oblique goldish hairs.

Head with a few deep punctures on frons and vertex, and a few medially on anterior portion of occiput; eye rounded oval. *Antenna* three-fourths as long as body, slender; first six segments subequal in length except second a little shorter; seventh and following segments longer; last appendiculate. *Prothorax* very slightly broader than long, nearly as broad at apex as at base, moderately and evenly rounded at side; disc rather heavily punctured, the punctures mostly a little smaller than spaces between them. *Scutellum* convex, tapering. *Elytron* subparallel-sided, tapering from end of third fifth; disc with rows of deep punctures which are mostly nearly as large as interspaces; discal rows disappearing on apical declivity. *Ventral surfaces* feebly punctured. Length 2.2 mm.; breadth 1 mm.

PARATYPES: Length 2.1–2.3 mm.; breadth 1–1.2 mm.

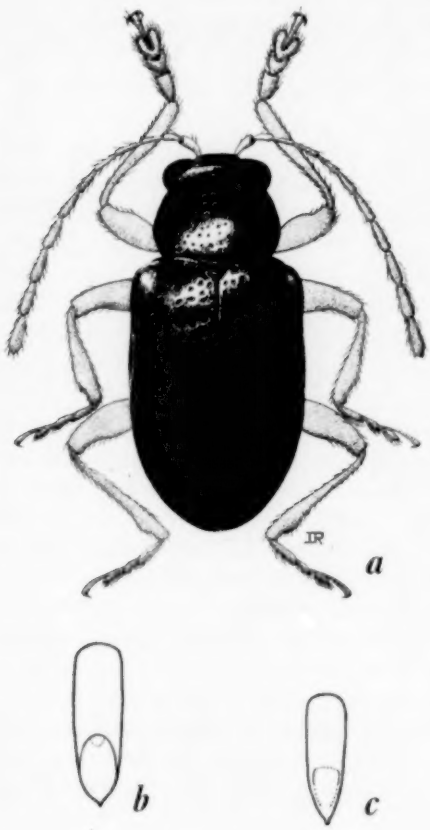

FIG. 15. *a*, *Vitibia obscura obscura* Gressitt, n. sp., type; *b*, *Vitibia obscura obscura*, aedeagus; *c*, *Vitibia obscura submetallica* Gressitt, n. subsp., aedeagus.

VITI LEVU: Holotype (BISHOP 2416), Navai-Nasonga trail, 1000 m., Sept. 12, 1938, Zimmerman; two paratopotypes, same data; four paratypes (one in BM) Nandarivatu, Sept. 2 and 5, and ridge west of Nandarivatu, Sept. 11, 1938, Zimmerman.

Differs from *V. vitiensis* Bryant in being smaller, darker, partly metallic, with much heavier puncturation.

40. *Vitibia obscura submetallica*
Gressitt, n. subsp.
Fig. 15*c*

FEMALE: Bronzy black, or pitchy to testaceous; head reddish anteriorly, bronzy black behind; antenna reddish tinged with pitchy; prothorax bronzy blackish, but bronzy testaceous on anterior and posterior borders and along median line; scutellum pitchy; elytron blackish bronzy, testaceous along basal half of suture and on apex; ventral surfaces blackish, becoming brownish towards apex of abdomen; legs testaceous.

Head with a few distinct punctures anteriorly, finely and sparsely punctured on occiput. *Antenna* three-fourths as long as body; first two segments swollen, first one-half again as long as second; third to sixth slender, subequal, each about as long as scape; seventh to last stouter and longer. *Prothorax* four-fifths as long as broad, not distinctly margined laterally, moderately punctured, the punctures mostly one-third or less as large as spaces between them. *Scutellum* narrowed and rounded behind. *Elytron* moderately punctured in regular rows, the punctures mostly smaller than interspaces, and disappearing at beginning of apical third. *Ventral surfaces* feebly punctured. Length 2.8 mm.; breadth 1.6 mm.

VANUA LEVU: Holotype, female (BISHOP 2417), Nakawanga, Oct. 8, 1955, Gressitt; allotype, male, and one paratype, female, same data. Another female, same data, entirely green, somewhat questionably this species.

The coloration varies from almost entirely blackish green, except for antenna and legs, to bronzy ochraceous with sides of prothorax and elytron, and suture, darker.

Differs from *V. obscura* in being darker and more metallic, and in having the pronotum more finely punctured, and the elytron with punctures lacking posteriorly.

41. ***Vitibia bryanti*** Gressitt, new name
Fig. 16*a*

Vitibia vitiensis Bryant, 1945 (*nec Nodostoma vitiensis* Bryant, 1942), Ann. and Mag. Nat. Hist. Ser. 11, 12: 424, fig. 7 (Fiji; type in Brit. Mus.).

Reddish ochraceous, paler on antenna, legs and abdomen. *Head* impunctate except on frons and middle of vertex; *prothorax* nearly impunctate, distinctly rounded at side; *elytron* with very short basal rows of punctures and only sutural and marginal row continuing to apex. Length 2.9–3.3 mm.

VITI LEVU: Tholo-i-suva, Aug., Mt. Victoria (type loc.), Sept. 1938, Zimmerman, nine specimens, at 150–1200 m.; also Lever.

HOST: *Agapetes vitiensis* leaf, at 1300 m.; Lever.

42. ***Vitibia testacea*** Gressitt, n. sp.
Fig. 16*b*

MALE: Ochraceous, subhyaline; slightly dull on parts of head and antenna. Ventral surfaces and appendages with sparse pale hairs.

Head seven-eighths as broad as prothorax, not quite as wide as deep, deeply punctured in middle; occiput feebly grooved anteriorly, indistinctly punctured. *Antenna* five-sixths as long as body, rather slender; scape one-fourth longer than second segment; third slightly longer than second; fourth longer than third, subequal to fifth; sixth slightly shorter; seventh to last longer, subequal. *Prothorax* seven-eighths as long as broad, more than five-eighths as broad as elytra, subevenly rounded at side, hardly narrower at apex than at base; disc feebly convex on central portion, with irregularly arranged punctures of varying sizes, mostly fairly strong, but smaller than interspaces, about eight in an approximate median line. *Scutellum* narrow, rounded-subacute apically. *Elytron* barely more than twice as long as prothorax, subparallel in basal two-thirds; disc convex, with a subbasal swelling, incompletely punctured in 11 rows at middle, the punctures varying in size from larger to much smaller than interspaces, and disappearing in apical third. *Ventral surfaces* impunctate on metasternum, finely punctured on abdomen. Length 2.8 mm.; breadth 1.3 mm.

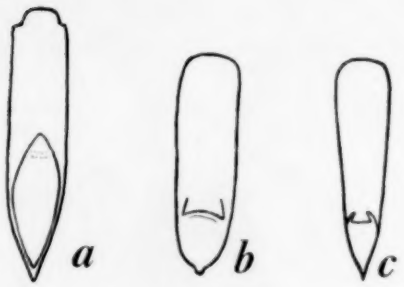

FIG. 16. *a*, *Vitibia bryanti* Gressitt, n. n., aedeagus; *b*, *Vitibia testacea* Gressitt, n. sp., aedeagus; *c*, *Vitibia virida* Gressitt, n. sp., aedeagus.

PARATYPES: Length 2.6–3.3 mm.; breadth 1.2–1.4 mm.

VITI LEVU: Holotype, male (BISHOP 2418), Nandarivatu, 1100 m., Sept. 6, 1938, Zimmerman. Two paratopotypes, Sept. 10, 1938, Zimmerman. Another, Mt. Victoria, 900 m., Sept. 16, 1938, Zimmerman, has the prothorax shorter and more coarsely punctured.

OVALAU: One, Andubangda, 400 m., July 15, 1938, Zimmerman.

Differs from *V. bryanti* Gressitt in being smaller, narrower, with the prothorax more rounded at side, less narrowed anteriorly, and more heavily punctured, and the elytron paler and a little more heavily punctured.

43. ***Vitibia virida*** Gressitt, n. sp.
Fig. 16*c*

MALE: Metallic green above, tinged in part with pitchy reddish on head and humerus; ventral surfaces pitchy on hind thorax, becoming testaceous towards end of abdomen; antenna dull reddish; legs testaceous wit

distal portions of fore femur pitchy. Abdomen, legs, and antenna with sparse suberect pale hairs.

Head nearly six-sevenths as broad as prothorax, about as wide as deep, moderately punctured in center; occiput finely grooved and hardly punctured. *Antenna* slender, four-fifths as long as body; scape two-thirds again as long as second segment; third a little longer than second, distinctly shorter than fourth; fifth equal to fourth, slightly longer than sixth; seventh to last longer, stouter, subequal. *Prothorax* slightly longer than broad, nearly two-thirds as broad as elytra, evenly rounded at side, widest at middle, barely narrower at apex than at base; disc convex, subevenly punctured, the punctures mostly about one-third as large as interspaces in center, and larger and closer at side. *Scutellum* small, rounded at side and obtuse apically. *Elytron* slightly more than twice as long as prothorax, slightly broadened behind middle, where it is somewhat inflated at top of lateral declivity; disc convex, somewhat regularly punctured in nine rows at middle, the punctures mostly about one-half as wide as interspaces, and suddenly becoming minute at end of second third. *Abdomen* feebly rugulose-punctate. Length 2.5 mm.; breadth 1.13 mm.

FEMALE: Length 2.4 mm.; breadth 1.34 mm.

VITI LEVU: Holotype, male (BISHOP 2419), Nandarivatu, 1100 m., Sept. 10, 1938, Zimmerman; allotype, female, Lami Quarry, near Suva, May 1951, Krauss. Three paratypes: Nandarivatu, Sept. 10, 1938, Zimmerman, Lami Quarry, May 1951 and Mar. 1955, Krauss.

Differs from *V. obscura submetallica* Gressitt in being almost uniformly metallic greenish above, in having the prothorax longer, symmetrical antero-posteriorly, and the aedeagus with terminal orifice proportionately shorter in relation to distance to bend, and apex a little more acuminate.

44. *Vitibia dimorpha* Gressitt, n. sp.
Fig. 17*a*, *b*

FEMALE: Pale ochraceous, marked with pitchy brown; head testaceous; antenna testaceous on first three segments, remainder pitchy with bases reddish; prothorax pale ochraceous with median line broadly pitchy, the line slightly broadened at middle; elytron pitchy reddish brown with a slight bronzy tinge, pale ochraceous on extreme base, testaceous on humeral ridge from behind humerus nearly to middle; ventral surfaces testaceous, duller at side of abdomen; legs testaceous. Legs and ventral surfaces sparingly clothed with short oblique goldish hairs; denser hairs on antenna.

Head sparsely and distinctly punctured on frons and vertex, slightly grooved on occiput; frons as deep as wide between antennal insertions. *Antenna* fully three-fourths as long as body, slender; first six segments subequal in length except second and third slightly shorter; seventh and following longer and slightly

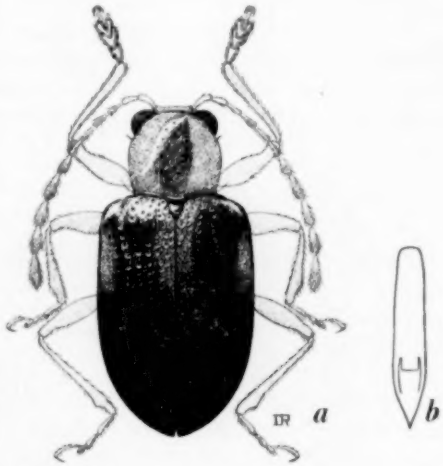

FIG. 17. *a*, *Vitibia dimorpha* Gressitt, n. sp., type; *b*, *Vitibia dimorpha*, aedeagus.

thicker; last appendiculate. *Prothorax* nearly as long as broad, almost as broad apically as basally, evenly rounded at side, distinctly rounded in outline of anterior margin; disc with deep punctures mostly separated by twice their diameters. *Scutellum* trapeziform, rounded behind. *Elytron* slightly broadened to just behind middle, then narrowed, distinctly carinate from humerus to middle; disc with regular rows of deep punctures, mostly as large as interspaces, the punctures suddenly becoming obsolete at end of third fifth, except for two outer rows and sutural row. *Ventral surfaces* feebly punctured. Length 2.65 mm.; breadth 1.35 mm.

MALE: Elytron not distinctly carinate behind humerus. Length 2.25 mm.; breadth 0.92 mm.

PARATYPES: Length 2.1–2.95 mm.; breadth 0.85–1.4 mm.

VITI LEVU: Holotype, female (BISHOP 2420), forest near Samabula, near Suva, Feb. 6, 1952, Gressitt, possibly on *Commersonia*; allotopotype, male (BISHOP), same data; eight paratopotypes (BISHOP, BM, USNM, CSIRO), same data. One female (BISHOP), Lami Quarry, near Suva, May 1951, Krauss. One male, Mt. Korombamba, 400 m., Aug. 1, 1938, Zimmerman.

Differs from *V. bryanti* Gressitt in being smaller, with dark and pale contrasted markings, with much heavier puncturation, and with the elytron carinate behind humerus in female.

45. *Vitibia pallipes* Bryant, n. sp.
Fig. 18

Narrowly elongate, metallic greenish black, legs long and slender; flavous, prothorax strongly but not closely punctured; elytron punctate-striate.

Head impunctate, frontal half flavous, basal half greenish black and nitid. *Antenna* long and slender, extending beyond middle of elytron; four basal segments fulvous, remainder black; two basal segments thickened; first twice as long as second. *Prothorax* shining, greenish black, about as broad as long; side slightly rounded, strongly but not closely punctured. *Scutellum* greenish black, triangular, nitid and impunctate. *Elytron* greenish black, wider than base of prothorax, elongate, sides parallel, rounded at apex, strongly punctate-striate, less so towards apex. *Legs* flavous, long and slender, middle and posterior tibiae emarginate near apex. *Underside* entirely flavous. Length 2.5 mm.

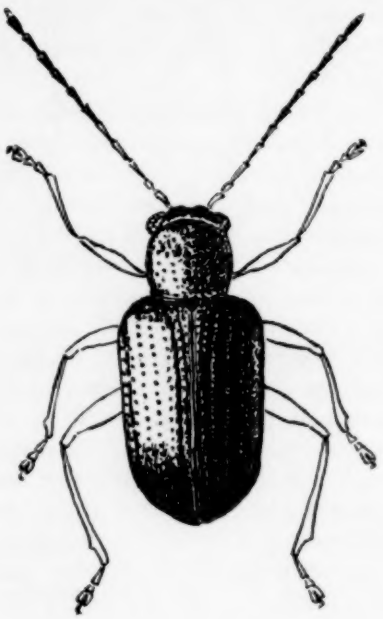

FIG. 18. *Vitibia pallipes* Bryant, n. sp.

VITI LEVU: Holotype, female (BISHOP 2421), Mt. Victoria, west slope, 1000 m., Tholo North, beating, Sept. 13, 1938, Zimmerman; one specimen.

Somewhat allied to *V. bryanti* Gressitt, but the color different, more elongate and narrower, and more strongly punctured.

Genus STYGNOBIA Weise

Stygnobia Weise, 1922, Arch. f. Naturgesch. 88 A (10): 154 (type: *S. cauta* Weise; Samoa).

Ovate, compact; eye small; antenna slender, flattened distally; prothorax transverse, nearly as broad as elytral base; elytron irregularly punctured; dorsum pubescent; middle tibia emarginate preapically; hind tibia hardly emarginate; claws bifid.

Except for Fiji, this genus has been recorded only from Samoa. The Fijian species are rather dissimilar in size and appearance from the type of the genus, but some of the Samoan species seem to be intermediate. The Fijian species resemble *Trichostola* in appearance, and in some characters, but probably belong more properly in *Stygnobia*.

KEY TO FIJIAN SPECIES OF *Stygnobia*

1. Body largely reddish or purplish brown to slightly metallic 2

   Body generally metallic greenish or bluish 4

2(1). Reddish brown, rarely almost pitchy; prothorax nearly as broad as elytra, closely punctured, but not subrugose; length 2 mm. 3

   Purplish brown to pitchy; prothorax narrower than elytra, very densely punctured; length 3 mm. . . . . **evansi**

3(2). Dorsum generally with golden pubescence, which is fairly brief on pronotum; central and basal portions of pronotal disc with interpunctural areas raised, almost ridge-like, and the punctures somewhat in rows converging towards center of base. . . . . **oconnori**

   Dorsum with white pubescence, which is rather long on pronotum and side of middle of elytron; central and basal portions of pronotal disc with interpunctural areas fairly flat, and the punctures somewhat in longitudinal rows which do not converge. . **albiseta**

4(1). Prothorax rather distinctly margined at side 5

   Prothorax somewhat feebly margined at side, very closely punctured; elytron a little less densely punctured; blackish to greenish or bluish; length 2–2.4 mm. . . . . **metallica**

5(4). Length less than 2.5 mm. 6

   Length more than 2.5 mm.; purplish bronzy above, with silvery to golden pubescence; legs, including femora, generally reddish . . . . . **elliptica**

6(5). Elytron somewhat vertical at side, more or less ridged behind humerus; pronotum very densely punctured. 7

   Elytron almost evenly declivitous at side, hardly ridged behind humerus; prothorax distinctly narrowed and declivitous anteriorly at side; pronotum rather finely punctured; body length less than 2 mm. . . . . **nandarivatu**

7(6). Prothorax about as broad as elytra, rather distinctly pubescent; dorsum generally green to golden green. . . . . **leveri**

   Prothorax slightly narrower than elytra, feebly pubescent; dorsum generally bronzy . . . . . **ovalaua**

46. ***Stygnobia evansi*** (Bryant) n. comb.

Trichostola evansi Bryant, 1942, Ann. and Mag. Nat. Hist. Ser. 11, 9: 510 (Bucalevu; type in Brit. Mus.).

Metallic with a purple tinge above, black beneath; clothed with fine gray pubescence; six basal antennal segments flavous; tibiae and tarsi fulvous. *Head* finely punctured, a transverse impression between eyes; *antenna* slender, third to sixth segments slender and subequal, last longest and acuminate; *prothorax* transverse, rounded at side, strongly and evenly punctured, clothed with fine pubescence; elytron parallel-sided, rounded apically, strongly and evenly punctured, clothed with fine gray pubescence, a slight depression below humerus. Length 2.5 mm.

VITI LEVU: Naivithula, Tailevu, Sept. 1937, Valentine; Nandarivatu, Sept., Tholo-i-suva and Belt road 25 km. west of Suva, July 1938,

Zimmerman; Suva, Feb. 1952, Gressitt; Raki Raki, Jan. 1955, Lami, Mar. 1951, Krauss. Thirty-seven specimens.

OVALAU: Andubangda and Draiba trail July 1938, Zimmerman.

TAVEUNI: Buthalevu.

LAU: Avea, Sept. 1924, Bryan.

47. ***Stygnobia oconnori*** Gressitt, n. sp.
Fig. 19*a*

Reddish ochraceous brown, slightly tinged with bronze above, paler ochraceous beneath and on appendages. Dorsum distinctly clothed with posteriorly curved silvery white hairs, part of which appear somewhat golden in certain lights.

Head two-thirds as broad as prothorax, moderately punctured, more densely so on posterior portion of occiput, and postocciput. *Antenna* nearly three-fourths as long as body, not very stout, gradually thickened from third segment; third segment barely as long as second, subequal to next two; remainder slightly longer. *Prothorax* more than four-fifths as long as broad, distinctly rounded at side, widest just behind middle, distinctly narrower apically than basally, slightly narrower than elytra; disc deeply, closely, and subrugosely punctured, the punctures partly sublongitudinal, or arranged longitudinally, in central portion. *Scutellum* small, narrow, narrowed and subrounded behind. *Elytron* short, subparallel in basal two-thirds, strongly convex, deeply and closely, and only in part subseriately punctured on basal half, much more finely and sparsely punctured on posterior half. *Ventral surfaces* deeply punctured in a few rows on metasternum, somewhat rugose on abdomen. Length 1.76 mm.; breadth 1.06 mm.

PARATYPES: Length 1.65–2.2 mm.; breadth 1–1.2 mm.

OVALAU: Holotype (BISHOP 2425), Andubangda, 400 m., beating, July 15, 1938, Zimmerman.

VITI LEVU: Nandarivatu, 1100 m., Sept. 3, Mt. Victoria, 1000 m., Sept. 13, Tholo-i-suva,

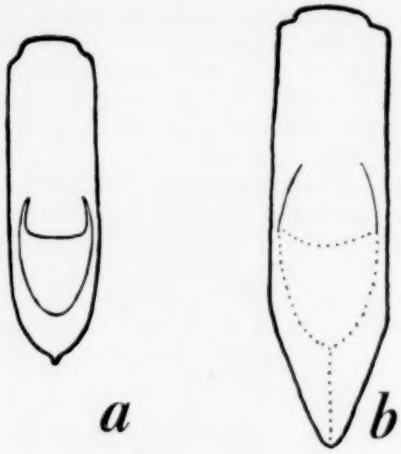

FIG. 19. *a*, *Stygnobia oconnori* Gressitt, n. sp., aedeagus; *b*, *Stygnobia albiseta* Gressitt, n. sp., aedeagus.

150 m., July 21, Navai-Nasonga trail, 1000 m., Sept. 12, 1938, Zimmerman. Natubakula, near Singatoka, Apr. 19, 1941; Lami Quarry, near Suva, May 1951, Krauss; Tholo-i-suva, Apr. 1951, Krauss.

VANUA LEVU: Nakawanga, 75 m., Oct. 9, 1955, Gressitt.

LAU: Buthalevu, 75 m., Aug. 10, Mbavatu, Aug. 16, 1938, Vanua Mbalavu I., Zimmerman.

A total of 19 paratypes.

Differs from *S. evansi* (Bryant) in being much shorter, paler, less purplish, less rugose, less regularly punctured, and with the prothorax relatively broader. Named for B. A. O'Connor, Senior Entomologist, Fiji, as a token of appreciation for kindnesses tendered.

48. ***Stygnobia albiseta*** Gressitt, n. sp.
Fig. 19*b*

MALE: Reddish brown; testaceous on front of head, antenna, and legs; head and pronotum very slightly bronzy. Body clothed above with fairly long, arched, whitish hairs, which are particularly long on pronotum and side of elytron; ventral surfaces more sparsely and briefly clothed with less whitish hairs.

Head deeply and somewhat closely punctured, flat on frons, slightly concave on anterior portion of occiput, grooved above eye. *Antenna* two-thirds as long as body, most segments thickened preapically; scape a little longer than second; third more slender than second, subequal in length; fourth slender, subequal to third; fifth longer; sixth and following stouter. *Prothorax* as broad as elytral bases, rounded at side, not quite three-fourths as long as broad; disc evenly convex, deeply punctured, the punctures closer than interspaces. *Scutellum* narrowed and rounded, slightly punctured. *Elytron* fully twice as long as prothorax, broadest near middle, strongly convex, deeply, closely, and in part subseriately punctured. *Ventral surfaces* deeply punctured on metasternum, feebly punctured on abdomen. Length 2.14 mm.; breadth 1.28 mm.

PARATYPES: Length 1.8–2 mm.; breadth 1.1–1.2 mm.

CENTRAL FIJI: Holotype, male (BISHOP 2454) Naroi, 300 m., Moala I., Aug. 24, 1938, beating shrubs, Zimmerman. Three paratopotypes (BISHOP, BM), same data.

Differs from *S. oconnori* Gressitt in having whiter and longer hairs, particularly on the pronotum, and in having the pronotal interspaces fairly flat, not ridge-like, and with the punctures on mid-basal portion of pronotum in parallel longitudinal rows, instead of converging rows.

49. **Stygnobia metallica** Bryant

Stygnobia metallica Bryant, 1945, Ann. and Mag. Nat. Hist. Ser. 11, 12: 425, fig. 8 (Taveuni; type in Brit. Mus.).

Dark metallic green, clothed with gray pubescence; antenna flavous with last two segments fuscous; fore and mid tibia flavous, each with basal third dark green; hind tibia flavous with basal half dark green. *Head* strongly but not closely punctured, frons almost impunctate; *antenna* slender, reaching middle of elytron, with first segment slightly longer than second, third subequal to second, fourth longer than third; *prothorax* strongly and closely punctured, widest at base, and side contracted anteriorly from middle and feebly margined; *scutellum* subquadrate; *elytron* irregularly punctate-striate, side tapering from behind middle to apex; meso- and metasterna strongly punctured; abdominal sternites more finely punctured and pubescent. Length 2.35 mm.

VITI LEVU: Nandarivatu, 950 m., Sept., Navai Mill, Sept. 17, Tholo-i-suva, July 27, 1938, Zimmerman. Lami Quarry, near Suva, May 1951, Krauss.

OVALAU: Andubangda, 300–450 m., Aug. 18, 1938, Zimmerman.

VANUA LEVU: Nakawanga, 75 m., Oct. 8, 1955, Gressitt.

TAVEUNI: Type locality (Crater Lake).

50. ***Stygnobia elliptica*** Gressitt, n. sp.
Fig. 20*a*, *b*

Bronzy with a purplish tinge above; scutellum greenish; venter pitchy tinged with purplish or bluish; appendages reddish ochraceous, slightly darker on apex of hind femur and somewhat pitchy brown on distal three-fifths of antenna. Dorsum distinctly clothed with curved, oblique golden hairs, appearing silvery in certain lights, particularly towards side.

Head five-eighths as broad as prothorax, subvertical and almost plane in front, moderately punctured, more heavily so on occiput, nearly ridged on postocciput. *Antenna* three-fifths as long as body, subcylindrical, narrowed in third to sixth segments; second to seventh segments subequal in length. *Prothorax* five-sevenths as long as broad, practically as broad as elytra, moderately narrowed and declivitous anteriorly at side; disc heavily, but not very deeply, punctured, the punctures for most part distinctly wider than interspaces. *Scutellum* subsquarish, obtuse behind. *Elytron* fully twice as long as prothorax, somewhat vertical at side, convex above, rather closely and irregularly punctured, the punctures form-

ing somewhat oblique longitudinal lines on central portion, mostly about as broad as interspaces on basal half, much finer posteriorly. *Ventral surfaces* deeply punctured on metasternum, more finely punctured on remainder. Length 2.7 mm.; breadth 1.5 mm.

VITI LEVU: Holotype (BISHOP 2426), Nandarivatu, 1100 m., beating shrubbery, Sept. 10, 1938, Zimmerman. Four paratypes (BISHOP, BM): Nandarivatu, Sept. 6–10, Mt. Korombamba, 400 m., Aug. 1, and Tholo-i-suva, 150 m., July 25, 1938, Zimmerman.

Differs from *S. leveri* (Bryant) in being longer, more bronzy, with more golden pubescence, and in closer pronotal puncturation.

51. ***Stygnobia nandarivatu*** Gressitt, n. sp.
Fig. 20*c*

Metallic green, with a slightly golden tinge, above; purplish pitchy beneath; antenna testaceous, becoming slightly pitchy beyond middle; legs testaceous. Dorsum distinctly clothed with posteriorly arched silvery white hairs, in some lights appearing slightly golden.

Head four-sevenths as broad as prothorax, rather broad and flat between antennal insertions and eyes, sparsely punctured, a little more coarsely punctured towards postocciput. *Antenna* three-fourths as long as body; first two and last five segments moderately thickened; scape distinctly longer than second segment; third about as long as second, slightly shorter than fourth; fourth to sixth subequal; seventh and following slightly longer. *Prothorax* four-sevenths as long as broad, as broad as elytral base, distinctly narrowed and declivitous at side, anteriorly; rounded at side, but hardly wider at any point than at base; disc deeply impressed with moderate-sized punctures which are mostly about as large as spaces between them. *Scutellum* narrowed and obtuse posteriorly, distinctly punctured basally. *Elytron* more than twice as long as prothorax, subevenly rounded in external outline, widest a little anterior to middle; disc deeply and distinctly punctured, the punctures only vaguely arranged in rows on basal half, where most of them are about as large as interspaces, and much sparser, finer, and less regular on posterior half. *Ventral surfaces* with only a few punctures on metasternum, and some vague wrinkling or minute punctures on abdominal sternites. Length 1.85 mm.; breadth 1.05 mm.

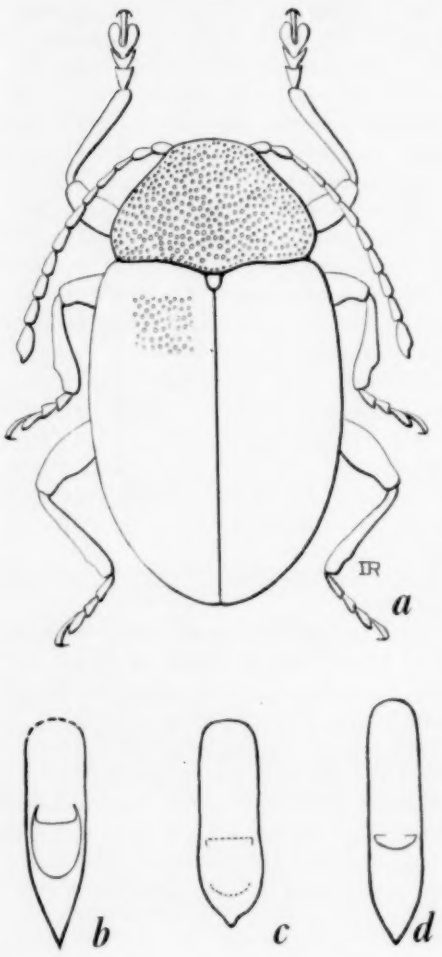

FIG. 20. *a*, *Stygnobia elliptica* Gressitt, n. sp., type; *b*, *Stygnobia elliptica*, aedeagus; *c*, *Stygnobia nandarivatu* Gressitt, n. sp., aedeagus; *d*, *Stygnobia ovalaua* Gressitt, n. sp., aedeagus.

PARATYPES: Length 1.65–2 mm.; breadth 0.95–1.1 mm.

VITI LEVU: Holotype (BISHOP 2427), Nandarivatu, Jan. 1955, Krauss. Six paratopotypes (BISHOP, BM, US), Oct. 18, 1937, Valentine; Sept. 14, 1938, 800 m., Zimmerman; Jan. 1955, Krauss.

Differs from *S. leveri* (Bryant) in having the elytron evenly convex and declivitous at side, and not vertical and ridged behind humerus, as well as the prothorax more narrowed anteriorly. The dorsum is entirely golden green and the legs are entirely pale.

52. ***Stygnobia leveri*** (Bryant), n. comb.

Trichostola leveri Bryant, 1942, Ann. and Mag. Nat. Hist. Ser. 11, 9: 511 (Nandarivatu; Taveuni; type in Brit. Mus.).

Cupreous above, black beneath; pubescent; first six antennal segments and legs flavous. Head strongly punctured and pubescent; antenna slender, with last five segments slightly thickened; prothorax strongly punctured and clothed with fine pubescence, strongly transverse, rounded at side; scutellum subquadrate; elytron strongly punctured, the punctures irregular, clothed with gray pubescence; meso- and metasternum strongly punctured; abdominal sternites almost impunctate. Length 2 mm.

VITI LEVU: Nandarivatu (type locality). Ridge west of Nandarivatu, Sept. 11, Mt. Korombamba, Aug. 1, Tholo-i-suva, Aug. 21, Belt road, 60 km. west of Suva, July 23, 1938, Zimmerman. Lami Quarry, near Suva, Mar., May 1951, Krauss. Near Suva, Feb. 6, 1952, Gressitt.

OVALAU: Andubangda, July 15, 1938, Zimmerman.

VANUA LEVU: Daku road, 12 km. east of Lambasa, on *Alphitonia* and *Glochidion*, Oct. 6, Navukuru to Nakawanga, Oct. 7, Nakawanga, on *Couthovia*, *Pipturus*, and *Alphitonia*, Oct. 8, 1955, Gressitt.

TAVEUNI: Near Buthalevu; Waiyevo.

HOSTS: *Alphitonia zizyphoides* (Spreng.) A. Gray; *Glochidion cordatum* (Muell. Arg.) Seem.; *Couthovia corynocarpa* A. Gray; *Pipturus argenteus* var. *lanosus* Skottsb.

53. ***Stygnobia ovalaua*** Gressitt, n. sp.
Fig. 20*d*

Metallic greenish black, slightly bronzy on pronotum, somewhat purplish on elytron, particularly at side; antenna testaceous except for last segment which is pitchy; legs purplish pitchy, testaceous on tarsi and apices of tibiae. Body moderately clothed with curved, posteriorly directed silvery hairs.

Head five-sevenths as broad as prothorax, fairly smooth and even, moderately punctured, more densely so on postocciput. *Antenna* nearly three-fourths as long as body, thickened basally and distally, very slender in third to sixth segments; scape a little longer than second; third slightly shorter than second and fourth; last longest. *Prothorax* about three-fourths as long as broad, somewhat evenly rounded at side, slightly narrower at apex than at base, slightly narrower than elytra; disc heavily punctured, the punctures mostly as wide as interspaces. *Scutellum* suboblong, obtuse behind. *Elytron* broadest near middle, distinctly narrowed posteriorly, vertical at side, somewhat ridged behind humerus; disc unevenly punctured, the punctures rather small, close and irregular on sutural half of basal portion, much stronger, and subseriate on humeral half of base, and much sparser and mostly irregular on posterior half. *Ventral surfaces* deeply punctured in rows on metasternum, feebly rugulose on abdomen. Length 2.08 mm.; breadth 1.17 mm.

OVALAU: Holotype, female (BISHOP 2428), Andubangda, 600 m., July 15, 1938, Zimmerman. Five paratopotypes (BISHOP, BM), same data.

MOALA: One, Naroi, 200 m., Aug. 24, 1938, Zimmerman.

VITI LEVU: One specimen, Tholo-i-suva, July 27, 1938, Zimmerman; another, possibly

this species, Nandarivatu, Sept. 6, 1938, Zimmerman.

Differs from *S. leveri* (Bryant) in having the prothorax narrower than the elytra, and more deeply and less closely punctured, the elytron a little more heavily punctured, and the dorsum more bronzy and more feebly pubescent.

EPINODOSTOMA Gressitt, new genus

Head deep, strongly raised on occiput, with a deep groove bordering upper half of eye; antenna distinctly thickened in distal half; prothorax feebly margined at side, slightly narrower than elytra, nearly as long as broad; elytra parallel, rounded apically, regularly seriate-punctate with one or two extra scutellar rows; middle and hind tibiae emarginate preapically on outer sides; tarsal claws bifid or toothed. Type: *Epinodostoma alocasiae* Gressitt, n. sp.

This genus differs from *Nodostoma* in being more slender, in having a deep groove above the eye, and in having the prothorax hardly margined laterally. Heretofore, the tarsal claw character—bifid (branched) or appendiculate (toothed basally)—has been considered of tribal value in this subfamily. However, though the following two species seem to differ on this point, they are otherwise extremely closely related. This fact, and other problems encountered in this study, indicate that this character has received undue importance, or that other generic characters have been overlooked.

54. ***Epinodostoma alocasiae***
Gressitt, n. sp.
Fig. 21

Shiny black with a purplish bronzy tinge, particularly on elytron; basal half of antenna, and much of tibiae and tarsi reddish. Glabrous on elytron, with very fine subrecumbent hairs on pronotum, and with sparse suberect hairs on ventral surfaces.

Head three-fourths as broad as prothorax, deeper than wide, with moderately strong punctures, and a deep groove bordering upper half of eye; occiput strongly raised above. *Antenna* three-fifths as long as body, moderately stout except for third to sixth segments which are slender; scape a little longer than second; third subequal to scape, fifth, and sixth; fourth slightly longer; seventh to last each a little longer than fourth. *Prothorax* nearly seven-eighths as broad as long, more than seven-eighths as broad as elytra, rounded at side, slightly narrower at apex than at base, broadest one-third from base, strongly convex; anterior portion strongly raised, and also strongly convex in dorsal outline of anterior margin; lateral margin barely perceptible; disc deeply and subregularly punctured, with roughly 15 punctures along an approximate median line. *Scutellum* slightly longer than broad, narrowed and subrounded apically. *Elytron* two and one-fourth times as long as prothorax, subparallel-sided in slightly more

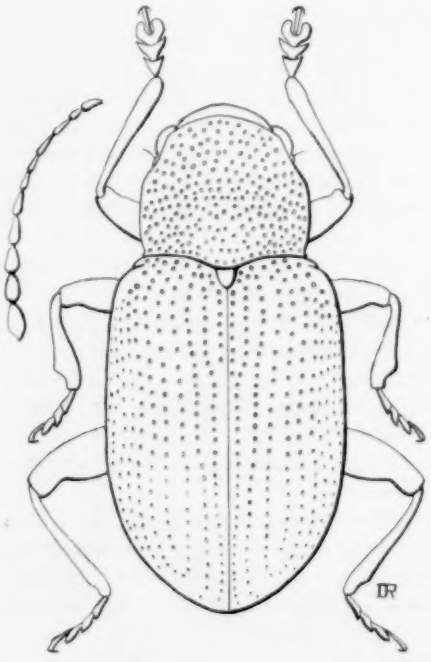

FIG. 21. *Epinodostoma alocasiae* Gressitt, n. sp.

than basal half, moderately narrowed posteriorly, strongly and subevenly convex, nearly vertical at side; disc regularly punctured in 11 rows at middle, with an extra scutellar row and an extra subhumeral row basally; punctures deep, distinct to apex, mostly separated longitudinally by spaces subequal to their diameters. *Metasternum* moderately punctured; abdominal sternites finely and irregularly punctured. Tarsal claws apparently bifid. Length 2.2 mm.; breadth 1.07 mm.

PARATYPES: Length 2.05–2.1 mm.; breadth 1–1.1 mm.

VANUA LEVU: Holotype, female (BISHOP 2422), Nakawanga, 50 m., central Vanua Levu, on *Alocasia*, Oct. 9, 1955, Gressitt; two female paratopotypes, same data.

HOST: *Alocasia macrorrhiza* (L.) Schott.

Differs from the following species in being smaller, more metallic, with the prothorax broader and more finely punctured, and the elytron more purplish and more finely punctured, and with one instead of two extra scutellar puncture-rows.

55. ***Epinodostoma elongata*** Bryant, n. sp.
Fig. 22*a*, *b*

Elongate, black, with metallic sheen, prothorax closely punctured, rounded at side. Elytron more strongly punctate-striate. Antenna and legs deep fulvous to pitchy.

Head metallic black, finely and closely punctured, with a median depression. *Antenna* extending almost to middle of elytron, deep fulvous; five apical segments slightly thickened. *Prothorax* about as broad as long, the sides feebly rounded; metallic, black, closely punctured. *Scutellum* small, triangular, impunctate. *Elytron* elongate, parallel-sided and rounded at apex, metallic, black, strongly punctate-striate. *Legs* deep fulvous; femora darker than tibiae; tarsal claws appendiculate. Length 2–2.5 mm.

VITI LEVU: Holotype (BISHOP 2423), Mt. Victoria, Tholo North, Sept. 13, 1938, beating shrubbery, Zimmerman; nine specimens.

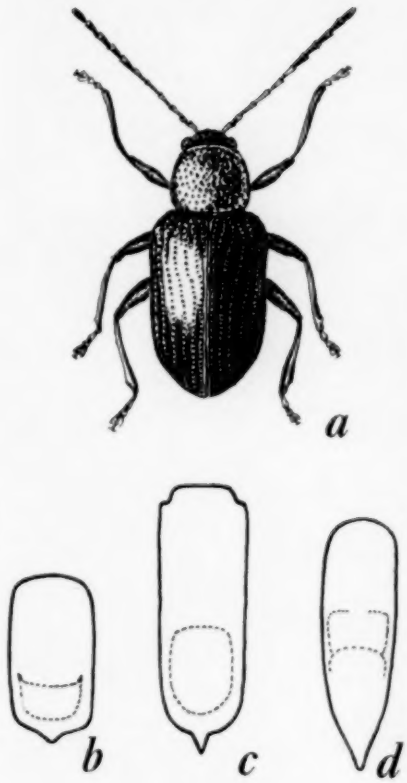

FIG. 22. *a*, *Epinodostoma elongata* Bryant, n. sp., type; *b*, *Epinodostoma elongata*, aedeagus; *c*, *Stethotes rufipes*, aedeagus; *d*, *Stethotes setosa* Gressitt, n. sp., aedeagus.

Somewhat similar to *V. pallipes* Bryant on account of its narrow elongate form, but the color of the legs very distinctive.

(TYPOPHORINI)

Genus EURYDEMUS Chapuis

Eurydemus Chapuis, 1874, Gen. Col. 10: 333 (type *E. insignis* Chapuis; Australia). Lefevre, 1885, Soc. Sci. Liege, Mem. Ser. 2, 11: 136.

Body large; head broad; antenna long and slender; prothorax narrowed anteriorly, dis-

tinctly margined; scutellum rounded; elytron striate-punctate; humerus prominent; femora swollen and toothed beneath; tarsi broad.

The following two species have been united, but appear quite distinct on the basis of material before us.

KEY TO FIJIAN SPECIES OF *Eurydemus*

1. Elytral punctures in regular, widely spaced longitudinal rows; dark reddish castaneous . . . . . **grandis**

   Elytral punctures larger, in numerous partly irregular rows, without broad smooth interpunctural strips; paler, somewhat brick-red . . . . . **insignis**

56. **Eurydemus grandis** (Baly)

Rhyparida grandis Baly, 1861, Jour. Ent. 1: 287 (New Caledonia).

Eurydemus grandis Baly, 1878, Linn. Soc. London, Jour. 14: 259.

Bright reddish, dark on distal portion of antenna, on tarsi, and parts of tibiae and on femoral apices. *Head* finely and closely punctured; *antenna* slender, segments subequal in length except second and third segments shorter, with second two-thirds as long as third; *prothorax* finely and fairly closely punctured; *elytron* regularly punctured in slightly sinuous, but even, rows, the interspaces between rows mostly twice as wide as punctures. Length 9–10.8 mm.; breadth 5–5.8 mm.

OVALAU: Wainiloka, Sept. 29, 1937, Valentine.

VANUA LEVU: Nakawanga, on *Phaleria* and *Flacourtia*, Oct. 9, 1955, Gressitt.

KANDAVU: Wai Salima and Ndavingeile, Apr. 1941, Krauss.

HOSTS: *Terminalia* leaf (Lever); *Phaleria acuminata* (A. Gray) Gilg (?), and *Flacourtia vitiensis* (Seem.) A. C. Smith.

57. **Eurydemus insignis** Chapuis

Eurydemus insignis Chapuis, 1874, Gen. Col. 10: 334, note 1, pl. 122, fig. 4 (Australia); Fairmaire, 1882, Soc. Ent. de France, Ann. Ser. 6, 1: 482 (Fiji).

Bright reddish brown, tinged in part with pitchy; somewhat brick-red on elytron. *Head* finely and somewhat closely punctured; *antenna* slender, segments subequal in length except second shorter; *prothorax* finely, but not very closely, punctured; *elytron* somewhat heavily punctured, but the punctures partly irregular, only in part forming regular rows. Length 11 mm.; breadth 5.5 mm.

TAVEUNI: Ngathabula (Qacabula) on *Tabernaemontana*, Nov. 1937, Valentine.

HOST: *Tabernaemontana* sp.

Genus STETHOTES Baly

Stethotes Baly, 1867, Ent. Soc. London, Trans. Ser. 3, 4: 254 (type here designated as *Pyropida elegantula* Baly, 1864; Amboina).

Ovate, strongly convex; eye entire, strongly swollen; prothorax narrower than elytra, distinctly narrowed anteriorly, feebly margined at side; elytron strongly narrowed posteriorly; femora swollen, generally toothed beneath (not so in Fijian species). The following may require a new genus.

KEY TO FIJIAN SPECIES OF *Stethotes*

1. Pronotum striate-punctate near anterior border; pronotum with more than 15 punctures in an approximate longitudinal median row; elytron with a few regular rows of punctures . . . . . **rufipes**

   Pronotum not striate-punctate, with less than 12 punctures in an approximate longitudinal median row; and with a submedian impunctate area; elytron with suberect hairs throughout; elytron with many subregular rows of punctures . . . . . **setosa**

58. **Stethotes rufipes** Bryant
Fig. 22*c*

Stethotes rufipes Bryant, 1945, Ann. and Mag. Nat. Hist. Ser. 11, 12: 426, fig. 9 (Mt. Lautoka, Loloti; type in Brit. Mus.).

Pitchy black, sometimes tinged with bluish; pronotum sometimes reddish; antenna testaceous; legs reddish. *Head* sparsely punctured, slightly striate on postocciput; *antenna* slender, third segment slightly longer than second, following subequal or slightly longer; *prothorax* rather strongly and evenly punctured, slightly striate near anterior border; *elytron* with punctures in regular rows, mostly much smaller than interspaces, one or two rows of outwardly directed pale hairs along suture in posterior two-thirds, and a small tuft of silvery hairs near apex. Length 3–3.5 mm.

VITI LEVU: Mt. Lautoka, Loloti; Nandarivatu, 1050 m., Sept. 5, and Belt road west of Suva near Korolevu, July 26, 1938, Zimmerman; Vuti Ndawa, Aug. 27, 1925, W. H. Ford.

It is interesting to note that this species is extremely similar in dorsal appearance to a certain cryptorhynchine weevil occurring in Fiji.

59. ***Stethotes setosa*** Gressitt, n. sp.
Fig. 22*d*

Dark reddish brown, slightly pitchy above, and on antenna beyond third segment; paler reddish brown on abdomen and first three antennal segments; legs reddish pitchy. Body moderately clothed above with fine suberect hairs, mostly dark on pronotum, as well as transversely oblique silvery hairs along suture, particularly in posterior half; ventral surfaces irregularly clothed with fine suberect hairs.

Head slightly narrower than prothorax, about as wide as deep, sparsely but distinctly punctured; frontoclypeus largely impunctate. *Antenna* slender, two-thirds as long as body; scape fully twice as long as second segment; third barely longer than second, shorter than fourth; fourth slightly longer than fifth; sixth shorter than fifth; seventh and following much longer. *Prothorax* nearly as long as broad, barely four-fifths as broad as elytra, narrowed apically; disc strongly and somewhat closely punctured, with an impunctate area anterior to center. *Scutellum* longer than broad, subrounded apically. *Elytron* more than twice as long as prothorax, strongly narrowed posteriorly, widest at end of basal third; disc with about 15 irregular rows of fine punctures, with one or two extra scutellar rows. *Metasternum* strongly punctured; abdomen finely punctured. Length 2.9 mm.; breadth 1.35 mm.

PARATYPES: Length 2.55 mm.; breadth 1.35 mm.

VITI LEVU: Holotype, male (BISHOP 2424), Belt road, 25 km. west of Suva, July 29, 1938, beating shrubs, Zimmerman; three paratypes, males, Lami Quarry, near Suva, May 1951, Krauss.

Differs from *S. rufipes* Bryant in being more reddish, more shiny, less elongate, with the pronotum more strongly punctured and not striate-punctate, the elytron somewhat bluish, more finely and closely punctured, and with the dorsum clothed with fine hairs throughout.

Tribe ADOXINI

Genus **PARADEMOTINA** Gressitt, new genus

Head nearly as broad as prothorax; eye prominent; occiput convex, finely carinate medially; antenna slender; prothorax slightly broader than long, very feebly margined at side, closely punctured, just over two-thirds as broad as elytra; elytron suboblong, subregularly lineate-punctate; middle and hind tibiae emarginate preapically on outer side; tarsal claws bifid, but with the accessory process near base, suggesting the appendiculate condition. Dorsal surface clothed with minute scales on elytron and scale-like hairs on pronotum. Type: *Parademotina aureotincta* Gressitt, n. sp.

The prothorax appears from some angles to be margined at side, and from other angles appears unmargined. There is a feeble irregular ridge along the side, but not a true margin.

The type of this genus differs from species of *Demotina* Baly in being narrower and shal-

lower, in having the head shorter and broader. the prothorax subrectangular, and the aedeagus much more slender and attenuated apically.

60. ***Parademotina aureotincta*** Gressitt, n. sp.
Fig. 23*a*, *b*

Black to pitchy black, paler on elytral base, clothed above with irregular minute golden scales or scale-hairs, fairly dense on side of occiput, in certain lights forming a sinuous longitudinal stripe on side of pronotal disc, and on elytron forming about ten more or less distinct sublongitudinal small spots, roughly arranged in about three obliquely transverse bands, but also with scattered scales between the spots, and particularly on extreme base and suture near scutellum; front portion of head testaceous; antenna testaceous, becoming brown distally; ventral surfaces reddish brown, with abdomen testaceous; legs testaceous, but pitchy on distal portions of femora and bases and apices of tibiae; abdomen with some very long erect hairs.

Head as broad as prothorax, wider than deep, granulose and finely carinate medially on occiput; interantennal space about one-half as wide as interocular space. *Antenna* three-fourths as long as body; scape stouter than second segment, and one-half again as long; third to sixth slender; third and fourth subequal; fourth barely longer than fifth; sixth distinctly longer than fifth; seventh to tenth longer, subequal, last longest. *Prothorax* nine-tenths as long as broad, three-fourths as broad as elytra, moderately rounded at side; disc somewhat uneven, closely and somewhat deeply punctured, with roughly 20 punctures in an approximate median line. *Scutellum* subtrapeziform, obtuse apically. *Elytron* twice as long as prothorax, gradually narrowed and rounded apically; disc distinctly and uniformly punctured in regular rows, with two or three irregular extra rows at base near suture; most of punctures slightly

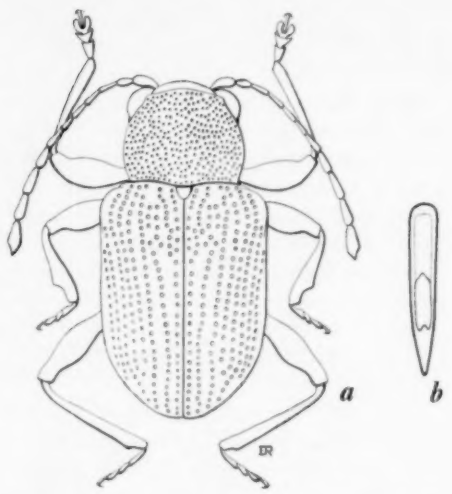

FIG. 23. *a*, *Parademotina aureotincta* Gressitt, n. sp., type; *b*, *Parademotina aureotincta*, aedeagus.

smaller than interspaces. *Ventral surfaces* moderately punctured on metasternum, feebly wrinkled and partly punctulate on abdominal sternites. Length 2.05 mm.; breadth 1.08 mm.

PARATYPES: Length 2.15–2.4 mm.; breadth 1.1–1.25 mm. Some with golden spots very vague.

VITI LEVU: Holotype (BISHOP 2429), near Suva, 100 m., Feb. 6, 1952, Gressitt. Four paratypes: Nandarivatu, 900–1100 m., Sept. 3–6, 1938, Zimmerman; Lautoka Mts., Oct. 23, 1921, Greenwood.

Differs from *Demotina obscurata* Bryant in being smaller, more dorso-ventrally compressed, darker, with small golden spots, with the head broader and shallower, the prothorax more rectangular, and the elytron less heavily punctured.

Genus DEMOTINA Baly

Demotina Baly, 1863, Jour. Ent. 2: 158 (type: *D. bowringii* Baly; China); 1867, Ent. Soc. London, Trans. (3) 4(2): 84; Chapuis, 1874, Gen. Col. 10: 281; Lefevre, 1885, Soc. Sci. Liege, Mem. Ser. 2, 11: 80; Jacoby, 1908, Fauna of India 2: 427.

Head narrower than prothorax; eye coarsely faceted; occiput generally finely carinate; antenna thickened distally; prothorax generally narrowed apically, often feebly margined at side; elytron suboblong; middle and hind tibiae emarginate preapically on outer side; tarsal claws bifid; dorsum clothed with fine scales or hairs.

KEY TO FIJIAN SPECIES OF *Demotina*

1. Elytron with some isolated fine erect hairs, or many short erect hairs, distinctly rugose and nodose if erect hairs not distinct 2

   Elytron without erect hairs, not strongly rugose 6

2(1). Pronotum often uneven or nodose; elytral erect hairs scattered, varying in length 3

   Pronotum and elytron evenly convex; pronotum densely pubescent; elytron with numerous short suberect hairs of similar length . . . . . **pubescens**

3(2). Pronotum with rather distinct nodes or tubercles 4

   Pronotum only moderately uneven, or body distinctly less than one-half as broad as long 5

4(3). Elytron with premedian and preapical swellings and other irregularities; pronotum deeply punctured, with central tubercles about as widely spaced as one-half breadth of pronotum; largely blackish . . . . **rugosa**

   Elytron without premedian and preapical swellings; pronotum finely punctured, with central tubercles conical, less widely separated than one-half breadth of pronotum; rarely blackish . . . . . **nodosa**

5(3). Body less than one-half as broad as long; hind femur exceeding elytral apex . . . . . **fragilis**

   Body fully one-half as broad as long; hind femur not exceeding elytral apex . . . . . **veitchi**

6(1). Pronotum broadest near base, distinctly flattened above, not evenly convex, finely punctured 7

   Pronotum rounded at side, as a rule strongly convex, or cylindrical-oblong, not distinctly flattened above and broadest near base, coarsely or finely punctured 9

7(6). Pronotum dull, with a vague subtransverse raised area anterior to center 8

   Pronotum shiny, subglabrous, rather smooth, without a transverse premedian raised area; elytron testaceous with dark brown sutural stripe and three suboblique bands extending out from stripe, the posterior two reaching side . . . . . **irregularis**

8(7). Elytron uniformly pale brown or with irregular transverse darker bands . . . . . **dissimilis**

   Elytron with a median dark brown stripe . . . . . **striata**

9(6). Elytron marked with some more or less distinct spots of white, silvery, or goldish hairs or scales 10

   Elytron not marked with pale spots of pubescence or scales 12

10(9). Elytron with several pale spots arranged somewhat in bands 11

   Elytron subglabrous, with four or five conspicuous spots of silvery pubescence, arranged somewhat irregularly, but partly in a sublongitudinal line . . . . . **albonotata**

11(10). Prothorax broader than long, not very strongly punctured; dorsum largely brown, often with silvery white longitudinal spots arranged in two suboblique bands behind middle of elytron . . . . . **obscurata**

Prothorax as long as broad, very strongly punctured; elytron with two or three obliquely transverse bands formed of small spots of white pubescence which are sometimes indistinct because of general pale pubescence . . . . . **bifasciata**

12(9). Dorsum generally black, appearing more or less glabrous, at least on pronotum 13

Dorsum rarely black, as a rule distinctly pubescent 14

13(12). Dorsum black with a golden tinge; pronotum nearly glabrous, shiny, rarely reddish . . . . . **metallica**

Dorsum black, non-metallic, thinly, but distinctly, pubescent . . **pallipes**

14(12). Dorsum largely pale, or pale marked with blackish, often without very dense golden pubescence 15

Dorsum pitchy black to dark reddish brown, with conspicuous golden to golden-buff pubescence; length 2–2.7 mm. . . . . **evansi**

15(14). Prothorax distinctly broader than long, distinctly convex at side . . . 16

Prothorax about as long as broad, feebly convex at side, much narrower than elytra . . . . . **cylindricollis**

16(15). Elytron with equivalent of about two extra rows of punctures near scutellum 17

Elytron with only one extra row of punctures near scutellum; dorsum entirely pale . . . . . **fulva**

17(16). Dorsum marked with spots of pitchy; length generally over 2.5 mm.; elytron in large partly thinly golden-buff pubescent . . . . **vitiensis**

Dorsum not distinctly marked with pitchy; length generally under 2.0 mm.; elytron in part rather densely golden pubescent . . . . . **glochidiona**

61. ***Demotina pallipes*** Bryant, n. sp.
Fig. 24*a*

Deep brown to black, with antenna and tarsi pale; feebly clothed with adpressed scales; prothorax closely punctured; elytron punctate-striate, the punctures large and round.

Head dark brown, finely punctured, clothed with slight pubescence. *Antenna* extending just beyond base of elytron, fulvous with apical segments slightly darker. *Prothorax* slightly broader than long, dark brown, closely punctured, clothed with slight pubescence; side rounded and slightly contracted in front; widest just before base. *Scutellum* dark brown, triangular. *Elytron* dark brown; punctate-striate, punctures large and round; clothed with adpressed scales. *Legs* dark brown; tarsi pale fulvous. Length 2–2.5 mm.

LAU: Holotype (BISHOP 2430), Mvana, Vanua Mbalavu I., Aug. 9, 1938, Zimmerman; beating shrubs. Mbavatu, Vanua Mbalavu, Aug. 16, 1938, Zimmerman; Sept. 23, 1924, Bryan. Naiau, Sept. 12, Tuvutha, Sept. 11, Avea, Sept. 22, Thikombia, Sept. 26, Yathata, Oct. 1, 1924, Bryan; Munia I., Aug. 3, 1938, Zimmerman and Kondo. One hundred fifteen specimens.

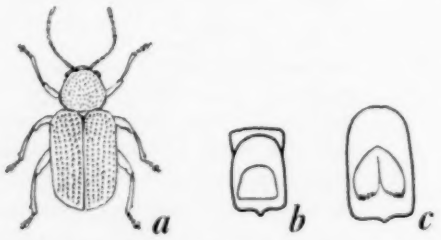

FIG. 24. *a*, *Demotina pallipes* Bryant, n. sp., type; *b*, *Demotina glochidiona* Gressitt, n. sp., aedeagus; *c*, *Demotina fulva*, aedeagus.

62. ***Demotina glochidiona*** Gressitt, n. sp.
Fig. 24*b*

Reddish brown, slightly darker on side of prothorax; legs testaceous, slightly darker on

apices of femora; antenna ochraceous; dorsum clothed with rather dense golden buff pubescence.

Head distinctly narrower than prothorax, deeper than wide, strongly arched and finely rugose-punctate on occiput, a narrow transverse groove between eyes. *Antenna* two-thirds as long as body; scape thicker and longer than second; third to sixth slender, third longer than fourth; fifth and sixth shorter, subequal; seventh and following longer and stouter. *Prothorax* four-fifths as long as broad, three-fourths as broad as elytra, evenly rounded at side, barely narrower at apex than at base; disc evenly convex, very closely and deeply punctured, with roughly 20 punctures in an approximate median line. *Scutellum* narrow, suboblong. *Elytron* twice as long as prothorax, suboblong, narrowed and rounded posteriorly; disc deeply punctured in somewhat sinuous rows, with two extra basal rows near suture, and some extra, and irregular rows at side, punctures on basal portion mostly larger than interspaces, particularly in longitudinal sense. *Ventral surfaces* largely impunctate, with a few fine punctures on abdominal sternites. Length 1.9 mm.; breadth 1.07 mm.

PARATYPES: Length 1.9–2.25 mm.; breadth 1–1.1 mm.

VANUA LEVU: Holotype (BISHOP 2431), Navakuru, 70 m., Oct. 7, 1955, Gressitt. Fourteen paratypes, Daku road, near Gelemumu, 12 km. east of Lambasa, on *Glochidion*, Oct. 6; Navakuru to Nakawanga, on *Glochidion*, Oct. 7; and Nakawanga, 75 m., on *Grewia*, Oct. 8, 1955, Gressitt.

HOSTS: *Glochidion cordatum* (Muell. Arg.) Seem.; *Grewia crenata* (Forst.) Schinz and Guill.

Differs from *D. vitiensis* Bryant in being smaller, almost entirely pale instead of with dark markings, and with denser pubescence of longer hairs or scales.

63. **Demotina fulva** Bryant
Fig. 24*c*

Demotina fulva Bryant, 1931, Ann. and Mag. Nat. Hist. Ser. 10, 8: 361, fig. 6 (Labasa; type in Brit. Mus.).

Oblong, subcylindrical; fulvous, clothed with golden adpressed scales, the scales more hair-like and longer on pronotum than on elytron. *Head* carinate medially; *antenna* with scape twice as long as second segment; next four slender and elongate; last five stouter; *prothorax* strongly punctured, rounded at side, contracted in front, widest behind middle; *scutellum* subtriangular; *elytron* oblong, prominent at humerus, strongly punctate-striate; *ventral segments* with scattered punctures, first abdominal sternite more strongly punctured and twice as long as second. Length 2 mm.

VITI LEVU: Vunindawa, May 1941, Krauss; Navai Mill, near Nandarivatu, Sept. 1938, Zimmerman.

VANUA LEVU: Lambasa (type locality); Mbua, Apr. 1939, Lever; Daku road, near Gelemumu, east of Lambasa, on *Maesa* and *Glochidion*, Oct. 1955, Gressitt.

LAU: Six, questionably this species: Munia I., Aug. 1938, Zimmerman; Mvana, Vanua Mbalavu I., Aug. 1938, Zimmerman; south of Marona, Mango I., Aug. 1938, Zimmerman; Olorua I., Aug. 1924, Bryan; Dakuiloa, Oneata I., Aug. 1938, Zimmerman.

HOSTS: *Maesa persicaefolia* A. Gray (?); *Glochidion cordatum* (Muell. Arg.) Seem.

64. ***Demotina metallica*** Bryant, new name
Fig. 25*a*

Trichostola vitiensis Bryant, 1942, Ann. and Mag. Nat. Hist. Ser. 11, 9: 509 (Nandarivatu, Nausori; type in Brit. Mus.).

Deep bronze above, black beneath; elytron clothed with gray pubescence; labrum, legs, and first three antennal segments fulvous.

Head closely punctured with fine pubescence; *antenna* slender, third to sixth segments slender and subequal, last acuminate; *prothorax* slightly transverse, strongly punctured, with fine scattered pubescence, and rounded side; *scutellum* subquadrate, impunctate; *elytron* parallel-sided, rounded apically, strongly punctate-striate, with very fine pubescence; *meso-* and *metasternum* strongly punctured. Length 2 mm.

VITI LEVU: Nandarivatu; Nausori. Nandarivatu, Oct. 1937, Valentine and ridge west of Nandarivatu, 800 m., Mt. Victoria, 900 m., Sept. 1938, Zimmerman; Lami Quarry, May 1951, Mar. 1955, Krauss.

OVALAU: Thawathi, Draiba trail, July 1938, Zimmerman.

VANUA LEVU: Nakawanga to Wailevu, Oct. 1955, Gressitt.

One hundred twenty-five specimens.

65. **Demotina vitiensis** Bryant

Demotina vitiensis Bryant, 1931, Ann. and Mag. Nat. Hist. Ser. 10, 8: 359, fig. 5 (E. Viti Levu; type in Brit. Mus.).

Plum-brown, with darker markings forming patches and irregular transverse bands; antenna with four basal segments flavous, the rest fuscous; prothorax clothed with fine whitish adpressed scales; elytron with very short fine scales. *Head* with short adpressed whitish scales; *antenna* slender, scape longer and more swollen than second; third and fourth long and slender, sixth a little shorter than fifth, and last five more swollen and subequal; *prothorax* slightly transverse, rounded at side, strongly punctured, median portion of base and side darker; *scutellum* subquadrate; *elytron* oblong, rounded apically, with scales shorter than those on pronotum, strongly punctate-striate, with four incomplete dark bands. Length 2.5 mm.

VITI LEVU: Nanduruloulou; Nausori; Suva; Mt. Lautoka. Nandarivatu and ridge west of Nandarivatu, 1000 m., Sept., Mt. Korombamba, Aug. 1938, Zimmerman; Belt road 14 km. west of Suva, Tholo-i-suva, July 1938, Zimmerman; Vunindava, May 1941, Krauss; Lami, May 1951, Krauss; Nasinu, Apr. 1951, Krauss.

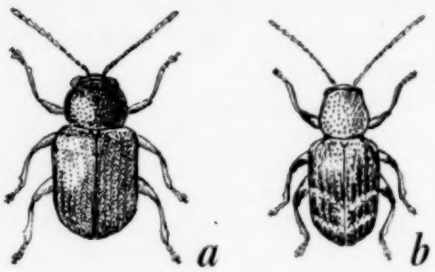

FIG. 25. *a*, *Demotina metallica* Bryant, n. n.; *b*, *Demotina bifasciata* Bryant, n. sp.

OVALAU: A doubtful specimen, Andubangda, July 1938, Zimmerman.

VANUA LEVU: Daku road, east of Limbasa, on *Glochidion* (100 specimens), *Macaranga*, *Decaspermum*, and *Psidium*, Oct. 1955, Gressitt; Nakawanga, Oct. 1955, Gressitt.

LAU: Olorua I., Fulanga I., Aug. 1924, Bryan; Munia I., Aug. 1938, Zimmerman. Some doubtful specimens, Mvana, Vanua Mbalavu I., Aug. 1938, Zimmerman; Aiwa I. and Oneata I., Aug. 1924, Bryan.

One hundred eighty-four specimens.

HOSTS: *Glochidion cordatum* (Muell. Arg.) Seem.; *Macaranga membranacea* Muell. Arg.; *Decaspermum fruticosum* Forst.; *Psidium guajava* L.

66. ***Demotina bifasciata*** Bryant, n. sp.
Fig. 25*b*

Oblong, subcylindrical, gray-black covered with short golden scale-like hairs; strongly punctured, elytron with two transverse bands formed of white patches of pubescence behind middle.

Head more or less fulvous, impunctate, clothed with short golden pubescence. *Antenna* fulvous, extending to middle of elytron; five terminal segments slightly thickened. *Pro-*

thorax about as broad as long, gray-black; anterior margin slightly fulvous, strongly punctured, covered with short golden scale-like hairs, with side feebly rounded. *Scutellum* gray-black, impunctate. *Elytron* gray-black, basal portion narrowly fulvous, subcylindrical, rounded at apex, strongly punctate-striate, clothed with fine golden scales, with two transverse bands behind middle, formed of whitish scale-like patches. *Underside* fulvous, with ventral segments of abdomen two to four about equal to each other and impunctate. *Legs* fulvous. Length 2 mm.

VITI LEVU: Holotype (BISHOP 2432), Nandarivatu, 1100 m., Sept. 10, 1938, Zimmerman; 14 specimens. Mt. Victoria, 950 m., Tholo North, Sept. 13, 1938, Zimmerman, 17 specimens. Lami Quarry, May 1951, Krauss, two specimens.

Allied to *D. obscurata* Bry., but smaller, not so dark, and with the transverse white patches on the elytron more numerous and differently placed.

67. **Demotina albonotata** Bryant

Demotina albonotata Bryant, 1931, Ann. and Mag. Nat. Hist. Ser. 10, 8: 364 (Loloti; type in Brit. Mus.).

Black, nitid, clothed with very fine scales; antenna ferrugineous, flavous on first four segments; elytron with three tufts of silky white scales, on base, side, and apex, respectively. *Head* carinate medially, a white patch of scales near inner margin of eye; *antenna* slender in middle; *prothorax* coarsely rugose-punctate, with fine grayish scales; *elytron* elongate, tapering. Length 2.75 mm.

VITI LEVU: Loloti. Belt road 80 km. west of Suva, July 26, 1938, Zimmerman; Navai-Nasonga trail, Sept. 12, 1938, Zimmerman; Lami Quarry, near Suva, May 1951, Krauss.

OVALAU: Andubangda, July 18, 1938, Zimmerman.

MOALA: Naroi, Aug. 24, 1938, Zimmerman.

Thirteen specimens.

68. **Demotina evansi** Bryant

Demotina evansi Bryant, 1931, Ann. and Mag. Nat. Hist. Ser. 10, 8: 362, fig. 7 (Quilai; type in Brit. Mus.).

Subcylindrical; gray-black, opaque, with a ferrugineous pattern on elytron, and clothed with adpressed short whitish scales which form longitudinal lines between elytral striae; appendages largely ferrugineous; ventral surfaces fuscous; legs reddish, in part fuscous or ferrugineous. *Head* rugose; *antenna* with scape longer than second segment, both more swollen than the four following; *prothorax* rugosely punctured, broadest behind middle; *elytron* oblong, strongly punctate-striate. Length 2 mm.

VANUA LEVU: Twenty, Daku road, east of Lambasa, Oct. 6, 1955, on *Glochidion*, *Commersonia*, *Macaranga*, and *Maesa*, Oct. 6, 1955, Gressitt; one, Nakawanga, Oct. 8, 1955, Gressitt.

TAVEUNI: Quilai (type locality).

HOSTS: *Glochidion cordatum* (Muell. Arg.) Seem.; *Macaranga membranacea* Muell. Arg.; *Commersonia bartramia* (L.) Merr.; *Maesa persicaefolia* A. Gray (?).

69. **Demotina obscurata** Bryant

Demotina obscurata Bryant, 1931, Ann. and Mag. Nat. Hist. Ser. 10, 8: 363, fig. 8 (Waiyevo; type in Brit. Mus.).

Gray-black, covered with short fine white scales; tibiae, tarsi, and six basal segments of antenna ferrugineous; elytron clothed with fine white scales and with five white patches of scales, three at middle and two at apex. *Head* with scales thicker and forming a white line near inner margin of eye; *antenna* slender, with scape a little longer than second segment and third one-half again as long as second; third to sixth long, slender and equal; *prothorax* finely punctured, about as broad as long, with scales longer than those of elytron; *elytron* oblong, tapering, strongly punctate-striate. Length 3 mm.

VITI LEVU: Eleven, questionably this species: Nandarivatu, Mt. Victoria, Navai-Nasonga trail, 1000 m., Sept. 1938, Zimmerman.

VANUA LEVU: Two, possibly this species: Daku road, east of Lambasa, on *Alphitonia*, Oct. 6, 1955, Gressitt.

TAVEUNI: Waiyevo (type locality).

HOST: *Alphitonia zizyphoides* (Spreng.) A. Gray.

70. **Demotina dissimilis** Bryant

Demotina dissimilis Bryant, 1931, Ann. and Mag. Nat. Hist. Ser. 10, 8: 358, figs. 3, 4 (Waiyevo; type in Brit. Mus.).

MALE: Plum-brown with adpressed whitish scales forming a pattern on elytron; antenna and legs fulvous. *Head* feebly punctured, carinate medially; *antenna* long and slender, fourth segment equal to second and third together; *prothorax* strongly and remotely punctured, widest behind middle; *scutellum* subquadrate; *elytron* oblong, strongly punctate-striate.

FEMALE: Stouter than male; antenna shorter and stouter; elytral pattern more defined, forming two wavy transverse bands on apical portion.

Length 3–3.25 mm.

VITI LEVU: Nandarivatu, Sept. 1938, Zimmerman, Jan. 1955, Krauss; Waito, Naivithula, and Korovou, Tailevu, Sept. 1937, Valentine; Navai Mill, Sept. 1938, Zimmerman; Mt. Korombamba, Aug. 1938, Zimmerman; Suva, Nov. 1899, Koebele; Lami, Mar. 1951, Mar. 1955, Krauss; Mbau, Apr. 1951, Krauss; Tholo-i-suva, Apr. 1951, Krauss; near Suva, Feb. 1952, Gressitt.

OVALAU: Thawathi, Wainiloka, Andubangda, July 1938, Zimmerman.

VANUA LEVU: East and south of Lambasa, Navakuru to Nakawanga, and Nakawanga, Oct. 1955, Gressitt.

TAVEUNI: Waiyevo (type locality). Ngathabula, Nov. 1937, Valentine; 1931, Lever, on *Clidemia*.

MOALA: Naroi, Aug. 1938, Zimmerman; Matuku I., July 1924, Bryan.

LAU: Munia I., Aug. 1938, Zimmerman; Namuka I., Aug. 1924, Bryan; Mango I., Sept. 1924, Bryan; Matuku I., 1924, Bryan. One hundred twenty-five specimens.

HOSTS: *Clidemia hirta* (after Lever); *Macaranga* sp., *Syzygium*, prob. *seemannianum* Merr. and Perry; *Psidium guajava* L.

71. ***Demotina irregularis*** Bryant, n. sp.
Fig. 26

Oblong subcylindrical; head fuscous; prothorax, antenna, and legs fulvous; elytra with an irregular gray-black pattern down the median portion, sides and suture flavous.

Head broadly fuscous near eye; occiput slightly fulvous; clothed with very short fine hairs. *Antenna* extending just beyond middle of elytron, first two segments slightly dilated; remainder elongate and slender; five apical segments slightly thickened. *Prothorax* fulvous, broadest just behind middle; side contracted in front; clothed with very short fine golden hairs. *Scutellum* fulvous, triangular, impunctate. *Elytra* slightly broader than base of the prothorax; side margin with an irregular

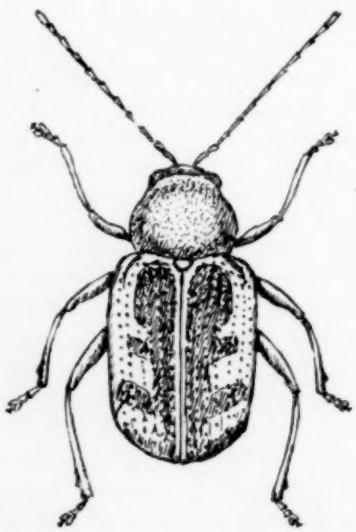

FIG. 26. *Demotina irregularis* Bryant, n. sp., type.

flavous pattern; suture narrowly flavous, the median portion forming a gray-black pattern running into the flavous margin; punctate-striate, clothed with very short pubescence. *Legs* fulvous. *Underside* with the meso- and metasternum fuscous; ventral segments of the abdomen fulvous. Length 2.5 mm.

VITI LEVU: Holotype (BISHOP 2433), Nandarivatu, 1100 m., Sept. 6, 1938, Zimmerman.

A very distinct species on account of the irregular pattern on the elytra.

72. *Demotina striata* Bryant, n. sp.
Fig. 27

Brown; head, prothorax, underside, and legs darker than elytron, clothed with adpressed scales; elytron paler with a longitudinal dark stripe between suture and side margin.

Head dark brown clothed with short silvery pubescence. *Antenna* extending just beyond base of elytron; fulvous, with five apical segments slightly darker. *Prothorax* dark brown clothed with fine adpressed scales, transverse, widest just before base, side rounded and contracted in front. *Scutellum* dark brown, subquadrate, impunctate. *Elytron* pale brown clothed with ashy adpressed scales, with a longitudinal dark stripe between suture and side margin. Length 4 mm.

VITI LEVU: Holotype (BISHOP 2434), Nandarivatu, Sept. 2, 1938, Zimmerman. Six paratopotypes, five, same data as type, one, Jan. 1955, Krauss. Also, four not designated paratypes: Belt road, 14 km. west of Suva, July 1938, Zimmerman; Lami Quarry, July 1938, Zimmerman, and May 1951, Krauss.

OVALAU: Andubangda, July 18, 1938, Zimmerman, one specimen; near Levuka, July 10, 1938, Zimmerman, one specimen.

A very distinct species on account of the well marked longitudinal dark stripe on the elytron.

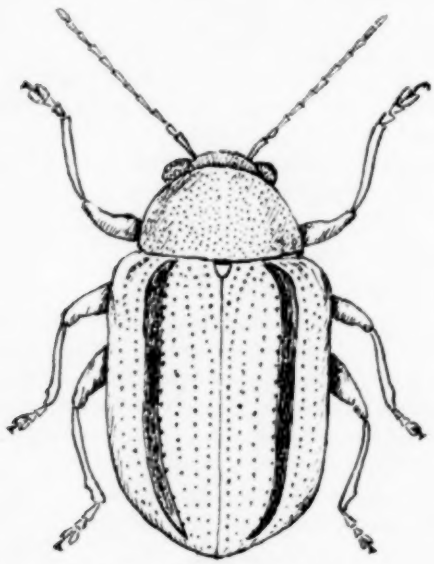

FIG. 27. *Demotina striata* Bryant, n. sp., type.

73. *Demotina pubescens* Gressitt, n. sp.
Fig. 28

FEMALE: Reddish brown, in part darker, largely clothed above with pale golden-buff to silvery buff pubescence, consisting largely of short suberect hairs, as well as minute hair-scales: head reddish, pitchy on each side of occiput; antenna reddish, duller in distal half; prothorax reddish brown, marked with blackish at sides, and a little on center; elytron reddish brown with a weak dark band anterior to middle and a slightly broader one just behind middle, and the scales on these bands dark reddish; ventral surfaces paler reddish, glabrous except for pale pubescence at side of thorax; legs reddish ochraceous, paler on tarsi.

Head four-fifths as broad as prothorax, deeper than wide, strongly punctured and glabrous on frontoclypeus; finely punctured, pubescent, and carinate on occiput. *Antenna* two-thirds as long as body, fairly slender; scape one-half again as long as second segment, about as long as third; fourth to sixth subequal, slender; seventh to tenth equal in length to preceding, slightly stouter; last slightly longer. *Prothorax* seven-eighths as

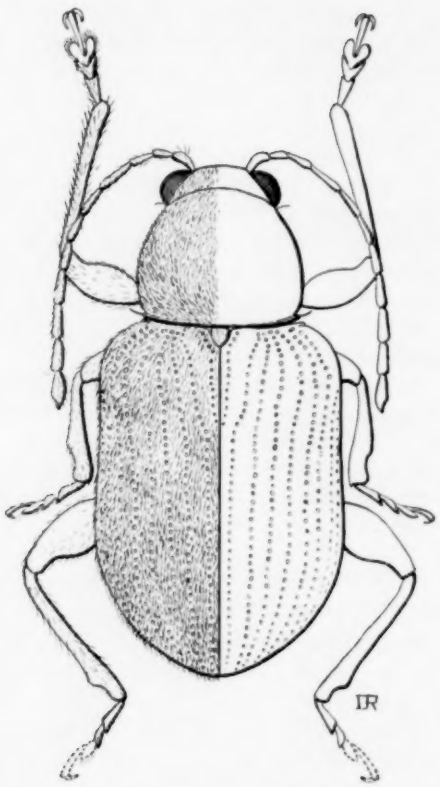

FIG. 28. *Demotina pubescens* Gressitt, n. sp.

long as broad, two-thirds as broad as elytra, rounded at side, widest near base; disc somewhat evenly convex, very finely and closely punctured. *Scutellum* subtrapeziform, obtuse apically. *Elytron* slightly more than twice as long as prothorax, slightly sinuate at side, narrowed apically; disc with about eight regular rows of fairly small punctures on upper surface, and three to five or six on side, which partly branch anteriorly, and a single distinct scutellar row; interspaces fairly broad, and mostly somewhat convex. *Ventral surfaces* largely impunctate, except for parts of side. *Legs* fairly slender; hind femur not reaching apex of abdomen. Length 4.75 mm.; breadth 2.5 mm.

PARATYPES: Length 4.5 mm.; breadth 2.25 mm.

MOALA: Holotype, female (BISHOP 2435), Naroi, 250 m., Moala I., beating shrubs, Aug. 24, 1938, Zimmerman. Paratopotype, female, same data.

Differs from the other Fijian species in having the dorsum clothed with short suberect hairs in addition to minute scales. Differs further from *D. veitchi* Bryant in having the pronotum more even, much more closely and finely punctured, and in having the elytral interstices mostly convex.

74. **Demotina veitchi** Bryant

Demotina veitchi Bryant, 1931, Ann. and Mag. Nat. Hist. Ser. 10, 8: 356, figs. 1, 2 (Labasa, Penang Mts.; type in Brit. Mus.).

MALE: Plum-brown; legs and antenna flavous, clothed with short white scales. *Head* with clypeus rather strongly punctured; *antenna* slender with scape twice as long as second segment, fourth longer than third or fifth, the last seven subequal; *prothorax* finely punctured, with scales longer and more hairlike at side, forming two longitudinal wavy lines enclosing median portion, which is paler; *scutellum* oblong-subpentagonal; *elytron* with darker lines and patches near shoulders, oblong, rounded at apex, strongly punctate-striate, apical half with long white erect hairs, forming longitudinal rows between striae.

FEMALE: Stouter; antenna shorter; elytral scales forming variable pattern.

Length 3–3.5 mm.

VITI LEVU: Penang Mts.; Nandarivatu, 800 m., Sept. 1938, Zimmerman; Tholo-i-suva, and Belt road, 80 km. west of Suva, July 1938, Zimmerman; Bulu, near Sovi, Apr. 1941, Krauss; Lami, Mar. 1951, Krauss; Naivithula, Tailevu, Aug. 1937, Valentine.

OVALAU: Andubangda, Draiba trail, and Wainiloka, July 1938, Zimmerman.

VANUA LEVU: Lambasa.

Fifteen specimens.

75. ***Demotina fragilis*** Gressitt, n. sp.
Fig. 29

Pale reddish brown, in part paler or darker: head reddish brown; antenna pale ochraceous; prothorax reddish brown, a pitchy stripe along each side of disc, elytron pale reddish brown, with some small irregular darker brown marks; ventral surfaces pale reddish brown, nearly testaceous on abdomen; legs testaceous, pitchy before femoral apices, and near tibial bases and apices. Dorsum somewhat unevenly clothed with minute buffy scale-hairs and with scattered erect hairs, particularly on posterior half of elytron.

Head five-sixths as broad as prothorax, slightly broader than deep, distinctly and not very closely punctured on frontoclypeus; occiput finely and sparsely punctured, feebly carinate medially behind an anterior depression. *Antenna* three-fourths as long as body, fairly slender; scape stout, nearly twice as long as second segment; third to sixth slender; fourth distinctly longer than third, and a little longer than sixth; last longest. *Prothorax* four-fifths as long as broad, seven-tenths as broad as elytra, somewhat evenly rounded at side, nearly as broad at apex as at base; disc slightly uneven, with a low swelling at each side just anterior to center, finely punctured, with roughly 20 punctures in an approximate median row. *Scutellum* "U"-shaped, slightly broadened at base. *Elytron* more than twice as long as prothorax, suboblong, narrowed apically; disc with eight regular puncture-rows above, with an extra scutellar row, and three to five partly irregular rows at side; punctures mostly almost as wide as interspaces longitudinally, but much narrower than interstices transversely. *Ventral surfaces* feebly and irregularly punctured. *Legs* long; hind femur exceeding elytral apex. Length 3.6 mm.; breadth 1.7 mm.

FIG. 29. *Demotina fragilis* Gressitt, n. sp., aedeagus.

VITI LEVU: Holotype, male (BISHOP 2436), Nandarivatu, 900 m., beating shrubs, Sept. 1, 1938, Zimmerman. Allotype, female (BISHOP), Lami Quarry, 50 m., near Suva, July 24, 1938, Zimmerman. Sixteen paratypes: Nandarivatu, Sept. 7–8, Tholo-i-suva, July 27, Belt road, 25 km. west of Suva, July 22, 1938, Zimmerman; Bulu, near Sovi, Apr. 21, 1941, Krauss; Lami Quarry, May 1951, Krauss; Naivithula, Tailevu, Aug. 18, 1937, Valentine.

OVALAU: Draiba trail, July 8, Wainiloka, 60 m., July 11, 1938, Zimmerman.

VANUA LEVU: Daku road, east of Lambasa, three on *Alphitonia* and one on *Commersonia*, Oct. 6, 1955, Gressitt; Nakawanga, Oct. 9, 1955, Gressitt.

HOSTS: *Alphitonia zizyphoides* (Spreng.) A. Gray; *Commersonia bartramia* (L.) Merr.

Differs from *D. veitchi* Bryant in being more slender, with the body less than one-half as broad as long, in having the legs longer, with the hind femur exceeding the elytral apex, the pronotum more even, and with the elytron less distinctly banded postmedially.

76. ***Demotina nodosa*** Bryant, n. sp.
Fig. 30*a*, *b*

Oblong, cylindrical, plum-brown, a paler transverse band behind middle of elytron, and apex paler; prothorax with two blunt tubercles on vertex, clothed with golden pubescence; elytron with shorter adpressed pubescence.

Head plum-brown, clothed with fine scattered golden pubescence, a longitudinal carina extending from between eyes to base. *Antenna* long and slender, extending almost to middle of elytron; first segment more dilated and twice as long as second; third slender and

twice as long as second; third to sixth each long and slender; remainder to apical segment slightly thickened and more pubescent, basal portion of each segment slightly fuscous. *Prothorax* plum-brown clothed with golden pubescence, widest just behind middle, and contracted in front, two blunt tubercles on vertex. *Scutellum* plum-brown, impunctate, rounded at apex. *Elytron* plum-brown, a transverse paler band behind middle, and apex paler; sides parallel and rounded at apex, punctate-striate, clothed with short adpressed golden pubescence. *Legs* with central portion of femora darker; tibiae with apical and basal portions darker. *Underside* fuscous, clothed with scattered pubescence; first ventral segment of abdomen longest. Length 5–5.5 mm.

VITI LEVU: Holotype (BISHOP 2437), Nandarivatu, Sept. 2, 1938, Kondo, one specimen. Nandarivatu, Navai Mill, Oct. 13, 1937, Valentine, four specimens. Nandarivatu, 1100 m., Sept. 3, 1938, Zimmerman, two specimens. Navai-Nasonga trail, Sept. 12, 1938, Zimmerman, three specimens; Mt. Victoria, 950 m., Sept. 16, 1938, Zimmerman.

A very distinct species, on account of the tuberculate prothorax.

77. ***Demotina rugosata*** Gressitt, n. sp.

Fig. 30*c*

Reddish brown to pitchy black, paler in part: head reddish brown, blackish on posterior portion of occiput; antenna ochraceous basally, pitchy on third to seventh segments, brown on remainder; prothorax reddish brown, largely pitchy to blackish at side; scutellum black; elytron dull reddish brown, with some of raised areas blackish and some of the lesser ones reddish or paler; ventral surfaces reddish brown, partly pitchy on first and last abdominal sternites; legs testaceous with femora black preapically, reddish apically, and tibiae partly pitchy subbasally and preapically. Dorsum somewhat irregularly and feebly clothed with minute goldish scales and a few erect hairs; ventral surfaces with a very few fine subrecumbent hairs.

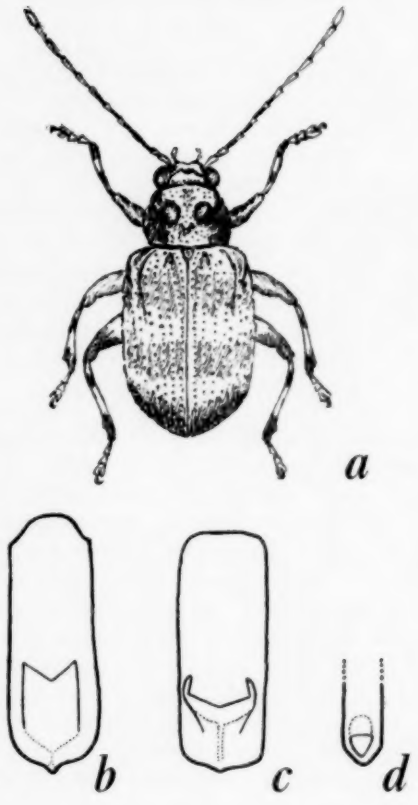

FIG. 30. *a*, *Demotina nodosa* Bryant, n. sp., type; *b*, *Demotina nodosa*, aedeagus; *c*, *Demotina rugosata* Gressitt, n. sp., aedeagus; *d*, *Demotina cylindricollis* Gressitt, n. sp., aedeagus.

Head slightly more than three-fourths as broad as prothorax, deeper than wide, distinctly punctured on the shiny frontoclypeus, more closely and finely punctured, and medially carinate, on the duller occiput. *Antenna* two-thirds as long as body, rather slender; scape nearly twice as long as second segment, barely longer than third; fourth slightly longer than third; fifth barely shorter than fourth,

longer than sixth; seventh to tenth stouter, about as long as sixth; last longer, suddenly narrowed before apex. *Prothorax* nearly as long as broad, two-thirds as broad as elytra, somewhat irregularly rounded at side; disc distinctly irregular, with an oblique raised area on each side of midline anterior to center, preceded anteriorly by an obtuse depression and slightly raised area on midline not far from apex; disc deeply impressed with longitudinal elliptical punctures, mostly more widely separated transversely than their widths; side very coarsely foveate- to reticulate-punctate. *Scutellum* narrowed, obtuse apically, convex. *Elytron* twice as long as prothorax, subrectangular, strongly rugose-punctate, for most part rather irregularly so, with two or three extra scutellar rows; disc with three distinctly raised areas in a rough line somewhat parallel to suture, near base, middle, and top of apical declivity, respectively, and also many other lesser nodes, ridges, or generally irregularly raised interstices. *Ventral surfaces* nearly impunctate. Length 4 mm.; breadth 2.2 mm.

PARATYPES: Length 3.5–4.2 mm.; breadth 1.8–2.2 mm.

VANUA LEVU: Holotype, female (BISHOP 2438), Nakawanga, alt. 80 m., on *Trichospermum*, Oct. 9, 1955, Gressitt. Six paratopotypes (one BM), same data, except two on *Macaranga* (probably by chance), Gressitt.

OVALAU: One, Andubangda, 500 m., July 15, 1938, Zimmerman.

VITI LEVU: Two, Belt road, 15–25 km. west of Suva, July 22, 29, 1938, Zimmerman; two, Lami, Mar. 1951, Krauss.

HOST: *Trichospermum calyculatum* (Seem.) Burret.

Differs from *D. nodosa* Bryant in being darker, in having the elytron much more irregular, with distinct tubercles and strong rugosity, and with the pronotum armed with a pair of widely spaced low oblique tubercles, instead of a pair of fairly close, conical tubercles.

78. ***Demotina cylindricollis*** Gressitt, n. sp.
Fig. 30*d*

Testaceous; prothorax slightly reddish ochraceous; antenna pale ochraceous, becoming slightly pitchy by last segment; elytral epipleuron and mesepimeron slightly pitchy reddish. Body clothed above with minute sparse golden scale-hairs, and on antenna with longer sparse oblique hairs; ventral surfaces nearly glabrous.

Head not quite as broad as prothorax, about as broad as deep; frontoclypeus very short, partly punctured; occiput finely and closely punctured; antennae almost as widely separated as eyes. *Antenna* nearly three-fourths as long as body; scape stout, a little longer and a little thicker than second segment; third to fifth slender, subequal; sixth barely shorter than fifth; seventh to tenth subequal, moderately stout; last longer, with apex more slender and set off. *Prothorax* nearly as long as broad, just over three-fifths as broad as elytra, feebly convex at side, fairly even above; disc finely punctured, with roughly 25 punctures in an approximate median row. *Scutellum* slightly longer than broad, widened at base, slightly convex apically, granulose. *Elytron* more than twice as long as prothorax, suboblong, narrowed apically; disc in part regularly punctured, with eight distinct puncture-rows above, behind middle, but about three extra, partly confused, scutellar rows, and four to six rows on lateral declivity; punctures mostly about as wide as interspaces longitudinally, but more widely separated between rows, at least in posterior two-thirds. *Ventral surfaces* nearly impunctate, except for bordering grooves of thoracic sternites and last abdominal sternite. Hind femur moderately stout, not reaching apex of abdomen. Length 2.4 mm.; breadth 1.25 mm.

PARATYPES: Some vague mottling on part of elytron. Length 2.3–2.5 mm.; breadth 1.1–1.3 mm.

VITI LEVU: Holotype (BISHOP 2439), west slope, Mt. Victoria, 950 m., Tholo North,

Sept. 16, 1938, Zimmerman. Two paratypes, ridge west of Nandarivatu, 850 m., Sept. 9, 1938, Zimmerman; one, Mavai, Sept. 1950, Krauss.

Two additional specimens, Nandarivatu, 1000 m., Sept. 6, 1938, Zimmerman, and Daku road, east of Lambasa, Vanua Levu, Oct. 6, 1955, Gressitt, appear to represent two different, related species. The former has the prothorax fully as long as broad, but in the latter it is broader and more rounded at side.

Differs from *D. fulva* Bryant in being smaller, more finely punctured, and with the prothorax longer and less rounded at side. This species probably represents a different genus.

Genus DAMELIA Clark

Damelia Clark, 1864, Jour. Ent. 2: 255 (type: *D. marshalli* Clark; Fiji); Chapuis, 1874, Gen. Col. 10: 271; Lefevre, 1885, Soc. Sci. Liege, Mem. Ser. 2, 11: 72.

Head small; last maxillary palpal segment acuminate; eye large. Antenna filiform, three-fourths as long as body, with scape swollen, second and third subequal, following longer and last shorter and stouter. Prothorax cylindrical, nearly as long as broad, dilated in middle, lateral border wanting, and surface irregular. Elytron broad, subquadrate, rounded apically, irregular, punctured and rugose-tuberculate.

KEY TO FIJIAN SPECIES OF *Damelia*

1. Color deep metallic or bronzy black **2**
   Color purplish black to greenish black; pronotal punctures coarse . . . . . **marshalli**
2. Elytron with close pubescence; legs with long pubescence; bronzy black . . . **rugosa**
   Elytron with scattered pubescence; legs with short pubescence; deep metallic brown . . . . . **verrucosa**

79. **Damelia marshalli** Clark

Damelia marshalli Clark, 1864, Jour. Ent. 2: 256 (Fiji; type in Brit. Mus.); Fairmaire, 1882, Soc. Ent. de France, Ann. Ser. 6, 1: 482.

Greenish black to purplish black, shiny. *Head* closely and in part confluently punctured; *antenna* distinctly thickened distally; *prothorax* slightly narrower than elytra, rounded at side, densely punctured and bearing three tubercles; *elytron* strongly and densely punctured and with somewhat oblong tubercles. Length 5 mm.; breadth 2.5 mm.

VITI LEVU: Presumably Viti Levu, though locality not specified. Lacking in present collection.

80. *Damelia verrucosa* Bryant, n. sp.
Fig. 31

Deep metallic brown, antenna and tibiae fulvous; rugosely punctured, prothorax with two large median blunt tubercles, and four small ones near side margin; elytron irregularly verrucose.

Head strongly punctured, a smooth longitudinal carina from between eyes to base;

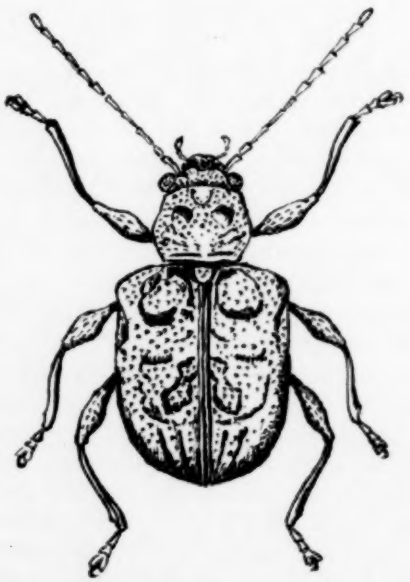

FIG. 31. *Damelia verrucosa* Bryant, n. sp., type.

not as broad as prothorax; clypeus and palpi flavous. *Antenna* fulvous, extending to middle of elytron; five basal segments fulvous and more glabrous than six apical segments, which are more fuscous; first segment more dilated and slightly longer than second. *Prothorax* deep metallic brown, side slightly rounded, rugosely punctured, two large median blunt tubercles, and two small ones near anterior half of side margin. *Scutellum* deep metallic brown, impunctate. *Elytra* deep metallic brown, much broader than base of prothorax, rounded at apex, strongly and irregularly punctured, and verrucose. *Legs* with femora dilated in middle, slender at base, strongly punctured, and with scattered pubescence; tibiae and tarsi more fulvous. *Underside* with ventral segments of abdomen tinged with fulvous, first segment equal to second and third together. Length 5–6 mm.

VITI LEVU: Holotype (BISHOP 2440), ridge west of Nandarivatu, 900 m., Apr. 13, 1937, Valentine. Six paratypes, Nandarivatu, 1000 m., Sept. 3, 1938, beating shrubbery, Zimmerman; Navai Mill, Nandarivatu, Oct. 13, 1937, Valentine.

OVALAU: Thawathi, 180–270 m., June 12, 1938, beating shrubbery, Zimmerman.

Allied to *D. marshalli* Clark, but differing in sculpture, and without any purple reflections, duller brown.

81. *Damelia rugosa* Bryant, n. sp.
Fig. 32

Bronzy black; antenna, labrum, palpi, and basal portions of femora and tibiae fulvous. Prothorax and elytron very rugose and irregularly punctured.

Head bronzy black, strongly and closely punctured, as broad at eyes as front of prothorax; labrum and palpi fulvous. *Antenna* fulvous, extending to middle of elytron; first segment more dilated, slightly longer than second; second shorter than third; fourth slightly longer than third, and equal to fifth; third to fifth elongate and more slender than six apical segments, which are slightly thickened. *Prothorax* much narrower than base of elytra, bronzy black, very rugose, strongly and closely punctured, widest behind middle, two blunt tubercles on disc and a small one near posterior angle. *Scutellum* bronzy black, its apex rounded. *Elytron* bronzy black, rugose and verrucose, irregularly punctured, rounded at apex, apical portion clothed with scattered pale pubescence. *Legs* bronzy black; femora with median portions swollen, strongly punctured and pubescent, basal portions narrow and fulvous; tibiae and tarsi more or less fulvous and clothed with pale pubescence. *Underside* bronzy black; ventral segments of abdomen pubescent. Length 5–6 mm.

FIG. 32. *Damelia rugosa* Bryant, n. sp., type.

VITI LEVU: Holotype (BISHOP 2441), Tholoi-suva, July 25–27, 1938, Zimmerman, beating shrubs; four specimens (one paratype in BM).

Allied to *D. marshalli* Clark, but differs in its more bronze color, in the sculpture of the prothorax and the elytra, and in the closer puncturation.

Tribe COLASPOIDINI

(IPHIMEINI and ENDOCEPHALINI)

Genus EUCOLASPIS Sharp

Eucolaspis Sharp, 1886, Roy. Dublin Soc., Trans. Ser. 2, 3: 445 (type: here designated as *Colaspis pallidipennis* White; New Zealand); Broun, 1893, Manual N. Zealand Col. 5: 1303.

Head small, rounded, engaged in prothorax; eyes widely separated. Antenna as a rule dilated at apex. Prothorax as broad at its base as elytra, or a little less broad, its side margin well marked and entire. Elytron ovate or briefly ovate, seldom oblong. Prosternum truncate, square at base. Legs simple, tibia of the posterior pair not emarginate; claws appendiculate.

A New Zealand species is a pest of apple trees.

KEY TO FIJIAN SPECIES OF *Eucolaspis*

1. Testaceous, rarely with borders of elytron blackish; elytral interstices impunctate . . . . . **castanea**

   Reddish to pitchy, with suture and outer margin black; elytral interstices micropunctulate . . . . . **saltator**

82. *Eucolaspis castanea* Bryant, n. sp.

Fig. 33*a*, *b*

Entirely castaneous, or with varying degrees of black on prothorax and elytron, head and prothorax impunctate, elytron finely punctate-striate.

Head castaneous, impunctate, with eyes as wide as front of prothorax. *Antenna* flavous, or in some with seven apical segments tinged with fuscous; two basal segments more dilated, first about twice as long as second; third to sixth long and slender; seventh to apex slightly thickened; extending to middle of elytron. *Prothorax* castaneous, or with varying degrees of black to entirely black, nitid, impunctate, narrowly margined all round, widest at base, gradually contracted to apex. *Scutellum* castaneous, impunctate. *Elytron* entirely castaneous or with side margins and suture fuscous, punctate-striate, widest at base, gradually tapering and rounded at apex. *Legs* castaneous, tibiae all straight and not emarginate apically. *Ventral surfaces* castaneous; first ventral segment of abdomen longest; second to fourth equal to each other. Length 2.6–3.3 mm.; breadth 1.9–2.1 mm.

VITI LEVU: Holotype (BISHOP 2442), Nandarivatu, Oct. 7, 1937, on *Scaevola*, Valentine; 14 paratopotypes, Valentine; six paratopotypes, 1100 m., Sept. 10, 1938, Zimmerman. One paratype, Mt. Victoria, Sept. 16, 1938, Zimmerman; one, Mt. Korombamba, Aug. 1, 1938, Zimmerman; ten, Lami Quarry, near Suva, Feb. and May 1951, Krauss.

HOST: *Scaevola floribunda* A. Gray.

83. *Eucolaspis saltator* Gressitt, n. sp.

Fig. 33*c*

MALE: Ochraceous, heavily marked with pitchy on inner portion, and outer margin, of elytron; antenna and legs testaceous.

Head rather even, with some strong punctures between eyes. *Antenna* slender, as long as body; scape swollen, twice as long as second segment; third nearly as long as scape, subequal to fourth; fifth and following slightly longer. *Prothorax* nearly twice as broad as long, nearly as broad as elytra, evenly convex, moderately rounded at side, with scattered large punctures and minute punctures between them. *Scutellum* rounded-triangular. *Elytron* widest just behind humerus, subevenly rounded, with nine rows of fine punctures, besides scutellar row. *Ventral surfaces* smooth, nearly impunctate, with a few suberect hairs, mostly on first abdominal sternite. Length 2.5 mm.; breadth 1.65 mm.

PARATYPES: Length 2.3–3.2 mm.; breadth 1.45–2.2 mm.

VANUA LEVU: Holotype, male (BISHOP 2443), between Navakuru and Nakawanga, 100 m., central Vanua Levu, on *Tarenna*, Oct.

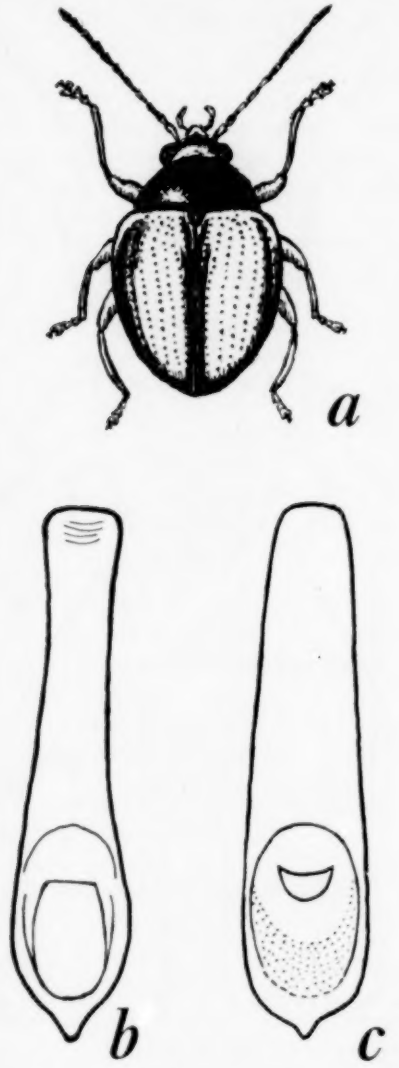

FIG. 33. *a*, *Eucolaspis castanea* Bryant, n. sp., type; *b*, *Eucolaspis castanea*, aedeagus; *c*, *Eucolaspis saltator* Gressitt, n. sp., aedeagus.

7, 1955, Gressitt; allotype, female (BISHOP), same data. Ten paratypes (BISHOP, BM, US, CSIRO): eight paratopotypes, mostly on *Tarenna*, same data; one, Navakuru, light trap, Oct. 6; one, Daku road, 12 km. east of Lambasa, on *Commersonia*, Oct. 6, 1955, Gressitt.

HOSTS: *Tarenna sambucina* (Forst.) Durand; *Commersonia bartramia* (L.) Merr.

Differs from *E. castanea* Bryant in being darker, in part blackish, with the head and pronotum more heavily punctured, the elytron micropunctulate between puncture-rows. This species was observed to jump.

Genus COLASPOIDES Laporte

Colaspoides Laporte, 1833, in Silberm. Rev. d'Ent. 1: 20 (type: *Cryptocephalus limbatus* Fabr.; S. America); Baly, 1864, Ent. Monthly Mag. 1: 134; 1867, Ent. Soc. London, Trans. (3) 4(2): 134; Chapuis, 1874, Gen. Col. 10: 346; Jacoby, 1908, Fauna of India, Chrys. 1: 514.

Head broad; antenna long and slender; prothorax nearly as broad as elytra basally, narrowed anteriorly, margined at side; elytron subregularly punctured; femora sometimes toothed beneath; claws appendiculate.

KEY TO FIJIAN SPECIES OF *Colaspoides*

1. Pronotum distinctly convex, distinctly narrowed anteriorly; breadth of body generally less than 2.5 mm. **2**

   Pronotum feebly convex, sparsely punctured; sides of prothorax nearly parallel in basal half; breadth of body generally at least 3 mm.; pitchy brown with a metallic tinge . . . . . **vitiensis**

2. Pale reddish brown, sometimes darker on pronotum, which is sparsely punctured; aedeagus of male deeply emarginate at middle of apex . . . . . **brunnea**

   Pitchy brown to dark reddish brown; pronotum more densely punctured, sometimes with interspaces hardly more than twice as wide as punctures; aedeagus of male with a strong blunt tooth at middle of apex . . . . . **confusa**

84. ***Colaspoides brunnea*** Bryant, n. sp.
Fig. 34*a*, *b*

Entirely pale brown; head coarsely punctured; prothorax irregularly and not closely punctured, elytron irregularly punctate-striate.

Head pale brown, coarsely punctured, labrum and clypeus smooth. *Antenna* pale brown, extending slightly beyond middle of elytron; first segment more dilated and twice as long as second; third about three times as long as second; third to last all about equal, slightly pubescent. *Prothorax* pale shining brown, very transverse, side feebly margined, rounded in front, irregularly and not closely punctured; basal portion smooth, with a row of punctures along basal margin. *Scutellum* brown, impunctate. *Elytron* pale brown, widest at base, gradually tapering to apex, irregularly punctate-striate, the punctures slightly stronger than on prothorax. *Legs* pale brown; tibiae clothed with pale pubescence; femora unarmed. *Underside* pale brown; ventral segments of abdomen feebly punctured. Length 5 mm.

OVALAU: Holotype (BISHOP 2444), Wainiloka, Sept. 28, 1937, Valentine, nine specimens.

VITI LEVU: Naivithula, Sept. 28, 1937, Valentine, one specimen; Lami Quarry, near Suva, May 1951, Krauss; Suva, Feb. 1952, Gressitt.

Allied to *C. vitiensis* Bry., and *C. tarsalis* Lea., but differs in its pale color without metallic gloss.

85. ***Colaspoides confusa*** Gressitt, n. sp.
Fig. 34*c*

Reddish brown; antenna and legs testaceous. Body glabrous above; ventral surfaces and legs with sparse fine oblique hairs.

Head nearly four-fifths as broad as prothorax, about as broad as deep, sparsely punctured, most densely so near antennal insertions; frontoclypeus concave in center. *Antenna* slender, two-thirds as long as body; scape three times as long as second segment; third subequal in length to scape and fourth; fifth distinctly longer, subequal to each of following. *Prothorax* about twice as broad as long, nearly as broad as elytra, subrectangular, moderately narrowed anteriorly, feebly obtuse in basal outline; disc moderately convex, with

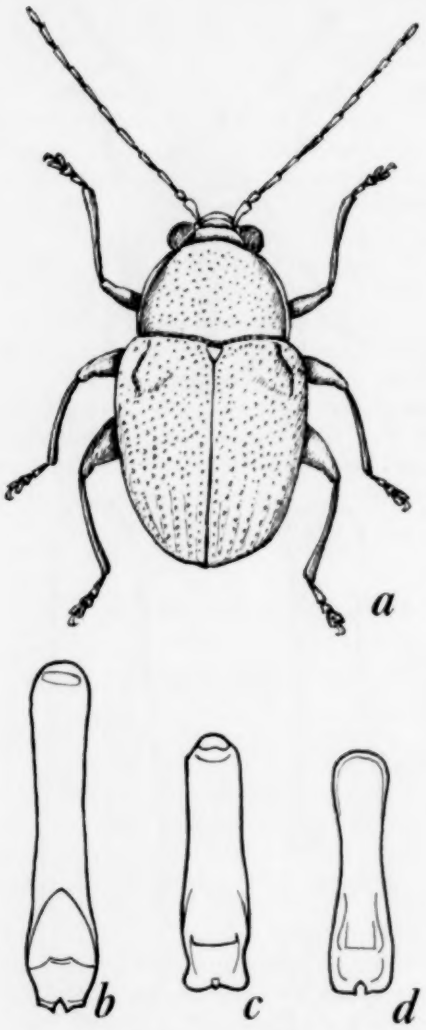

FIG. 34. *a*, *Colaspoides brunnea* Bryant, n. sp., type; *b*, *Colaspoides brunnea*, aedeagus; *c*, *Colaspoides confusa* Gressitt, n. sp., aedeagus; *d*, *Colaspoides vitiensis*, aedeagus.

fairly numerous distinct punctures, some separated by as little as twice the diameter of a puncture. *Scutellum* rounded-triangular, finely frosted. *Elytron* three times as long as prothorax, somewhat deeply punctured in more than ten very irregular rows. *Ventral surfaces* finely punctured. Length 4.5 mm.; breadth 2.35 mm.

PARATYPES: Mostly pitchy castaneous with a slight metallic sheen. Length 3.9–4.7 mm.; breadth 2.1–2.7 mm.

VITI LEVU: Holotype, male (BISHOP 2445), hill behind Suva, 100 m., Feb. 6, 1952, Gressitt; allotopotype, female, same data; one paratopotype, same data; 48 paratypes (BISHOP, BM, US, CSIRO), Lami Quarry, May 1951, Mar. 1955, Krauss; one, Vuti Dawa, Aug. 27, 1925, W. H. Ford; one, Belt road, 25 km. west of Suva, July 22, 1938, Zimmerman; one, 6 km. south of Nandarivatu, 700 m., Sept. 9, 1938, Kondo.

There is one doubtful specimen from Tuvutha, Lau, Sept. 10, 1924, Bryan, and another from Navai Mill, near Nandarivatu, Sept. 17, 1938, Zimmerman.

Differs from *C. vitiensis* and *C. brunnea* in having the aedeagus of male distinctly toothed, instead of deeply emarginate, at middle of apex, and in having the pronotum more closely punctured.

86. **Colaspoides vitiensis** Bryant
Fig. 34*d*

Colaspoides vitiensis Bryant, 1938, Roy. Ent. Soc. London, Proc. B 7(11): 250 (Makongai and Viti Levu; type in Brit. Mus.).

Reddish brown with metallic gloss; antenna and legs slightly paler. *Head* distinctly punctured, more closely so between eyes; *antenna* extending a little beyond middle of elytron; *prothorax* very convex, with large irregularly distributed punctures; *scutellum* impunctate, subtriangular; elytra with not very dense, but rather large punctures, becoming smaller and in regular striae posteriorly; femora unarmed. Length 4.5 mm.

VITI LEVU: Tamavua; Nausori. Mt. Victoria, west slope, 950 m., Tholo North, Nandarivatu, 1100 m., Navai Mill, Sept., Tholo-i-suva, July 1938, Zimmerman; Navai Mill, Oct. 1937, Valentine; Lami, Mar. 1955, Krauss.

OVALAU: Wainiloka, Sept. 1937, Valentine.

VANUA LEVU: Nakawanga, on *Phaleria*, Oct. 1955, Gressitt.

CENTRAL FIJI: Makongai I. (type locality).

LAU: Tubutha I., Sept. 1924, Bryan.

HOST: *Phalaeria acuminata* (A. Gray) Gilg.

Subfamily *CHRYSOMELINAE*

Genus PLAGIODERA Redtenbacher

Plagiodera Redt., 1845, Gatt. Deutsch. Käferf.: 116 (type: *Chrysomela versicolora* Laicharting (*armoraciae*, Redt. *nec.* Linn.); Europe, Asia).

Roundish, convex; metallic. Head broad; antenna short; prothorax transverse, oblique at side, emarginate anteriorly; elytron irregularly punctured in large part; epipleuron broad; tarsal claws simple.

87. **Plagiodera violaceipennis** Bryant

Plagiodera violaceipennis Bryant, 1925, Ann. and Mag. Nat. Hist. Ser. 9, 15: 594 (Natova; Ovalau; type in Brit. Mus.).

Fulvous with antenna darker distally, elytron metallic bluish purple. *Head* longitudinally impressed between eyes; *antenna* with scape longer than second segment and about equal to third, last seven segments more flattened and subequal; *prothorax* smooth and shiny, more than twice as broad as long; *elytron* finely and irregularly punctate, broadest behind middle, apical angle produced into a minute tooth, lateral border slightly flattened and reflexed, humeral callus strongly marked, base slightly depressed; central portions of abdominal sterna smooth and shiny, with sides unevenly punctured, last sternite slightly notched. Length 8 mm.

VITI LEVU: Natova (type locality).

OVALAU: (type series).

VANUA LEVU: Nakawanga and Navukuru, Oct. 1955, Gressitt; five specimens.

MAKONGAI: May 1941, Lever; several specimens.

LAU: Yathata, Oct. 1924, Bryan; 60 specimens.

Subfamily *GALERUCINAE*

KEY TO FIJIAN GENERA OF GALERUCINAE

1. Elytral epipleuron narrow from before middle (or pronotum irregular and elytron shorter than abdomen); anterior coxal cavity open behind; pronotum transversely grooved or irregular....2

   Elytral epipleuron gradually narrowed; anterior coxal cavity closed behind; pronotum convex, or broadly and evenly concave, but not narrowly grooved across middle.....5

2(1). Elytral epipleuron gradually narrowed 3

   Elytral epipleuron suddenly narrowed anterior to middle; tarsal claws bifid; pronotum with a slightly sinuate groove.....**Aulacophora**

3(2). Elytron entire; hind wing present; pronotum transversely grooved.....4

   Elytron shorter than abdomen; hind wing absent; pronotum irregular; tarsal claws bifid.....**Khasia**

4(3). Antenna simple in male, slender..... .....**Haplosomoides**

   Antenna stout, with sixth, seventh, or eighth segments enlarged in male.... .....**Cerophysa**

5(1). First hind tarsal segment much shorter than one-half tibial length.....6

   First hind tarsal segment about one-half as long as tibia.....**Metrioidea**

6(5). Tarsal claws bifid; pronotum broadly concave.....**Malacotheria**

   Tarsal claws appendiculate; pronotum convex, with one or two slight depressions on side of disc....**Plesistia**

Tribe OIDINI

Genus AULACOPHORA Duponchel and Chevrolat

Aulacophora Duponchel and Chevrolat, 1842, IN d'Orbigny, Dict. Univ. Hist. Nat. 2: 337 (type: *Galleruca quadraria* Olivier; Europe); Maulik, 1936, Fauna of India, Col. Chrys. Galeruc., 169.

Raphidopalpa, *Rhaphidopalpa*, *Ceratia*, *Orthaulaca*. (See Gressitt, 1955, Insects of Micronesia 17(1): 22 for fuller synonymy.)

Body fairly broad; antenna slender, sometimes with some segments broadened in males; pronotum with a sinuous or transverse groove across disc just behind middle.

KEY TO FIJIAN SPECIES OF *Aulacophora*

1. Elytron unicolorous, yellow or black; prothorax obtusely rounded at side.....2

   Elytron pale marked with a large basal and a large subapical black area, the former nearly reaching suture; prothorax subangulate at side.....**quadrimaculata**

2. Dorsum entirely testaceous to reddish testaceous; elytron distinctly broadened behind middle.....**similis**

   Elytron black, shiny, suboblong, hardly broadened behind middle....**nigrivestis**

88. **Aulacophora nigrivestis** (Boisduval)

Galleruca nigrivestis Boisduval, 1835, Voyage Astrolabe, Col.: 548 (New Holland; type in Paris Mus.).

Aulacophora nigrivestis, Allard, 1889, Soc. Ent. de France, Ann. 57: 310; Baly, 1889, Ent. Soc. London, Trans. 1889: 301.

Ceratia (*Orthaulaca*) *nigrivestis*, Weise, 1924, Coleopt. Cat. 78: 15.

Testaceous; elytron shiny black; abdomen black except for extreme apex; antenna ochra-

ceous with third to eighth segments pitchy. Antenna slender; prothorax broadest one-third its length from apex, but not angulate at side, the disc with a broad slightly obtuse groove just behind middle; elytron finely punctured. Length 9–9.5 mm.; breadth 4.4–4.8 mm.

VITI LEVU: Nandarivatu, 700 m., Nov. 1940, Degener; Nandarivatu, 800 m., at light, Sept. 6–8, 1938, Zimmerman.

89. **Aulacophora quadrimaculata** (Fabricius)

Crioceris quadrimaculata Fabr., 1781, Spec. Ins. 1: 152 ("Cape of Good Hope"; type in Brit. Mus.).

Aulacophora quadrimaculata Maulik, 1929, *Insects of Samoa* 4(3): 194; Veitch and Greenwood, 1921, Linn. Soc. N. S. Wales, Proc. 46: 511; Lever, 1942, Agr. Jour. [Fiji] 13(2): 48; Gressitt, 1955, *Insects of Micronesia* 17 (1): 26.

Galleruca austrocaledonica Montrouzier, 1861, Soc. Ent. de France, Ann. 4(1): 299 (New Caledonia).

Aulacophora tetrastictoptera Lea, 1924, Queensland Mus., Mem. 8: 50.

Testaceous, slightly more ochraceous on pronotum, marked with black on hind portion of head, except median line, with a large basal and a large subapical black area on elytron; ventral surfaces with most of metasternum and abdomen black. Antenna with third segment slightly thickened distally in male; prothorax sinuate at side, broadest and subangulate anterior to middle, with disc finely and irregularly punctured and with a slightly sinuate, shallow, transverse groove just behind center; elytron finely punctured. Length 4.6–7 mm.; breadth 2.3–3.4 mm.

YASAWA: Yalobi, Waya I., July 1937, St. John.

VITI LEVU: Lowlands.

OVALAU: Andubangda, July 1938, Zimmerman.

LAU: Vanua Mbalavu, Sept. 1924, Bryan; Wailangilala, Sept. 1924, Bryan; Oneata, Aug. 1924, Bryan.

KANDAVU: Wai Salima, Ndavingeile, and Kaivala, Apr. 1941, Krauss.

HOSTS: *Citrullus vulgaris* Schrad., *Cucurbita pepo* DC, and other cucurbits.

90. **Aulacophora similis** (Olivier) Fig. 35

Galeruca similis Olivier, 1808, Entomologie 6: 624, no. 93, pl. 2, fig. 23 (E. Indies).

Orthaulaca similis, Weise, 1892, Deutsche Ent: Zeitschr. 1892: 393.

Aulacophora fabricii, Knowles, 1907, Legislative Council Paper, Fiji, No. 13, Report for 1906; Jepson, 1911, Fiji Dept. Agr., Council Paper 25: 58.

Aulacophora argyrogaster, Veitch and Greenwood, 1921, Linn. Soc. N. S. Wales, Proc. 46: 511.

Aulacophora similis, Maulik, 1929, *Insects of Samoa* 4(3): 192; Gressitt, 1955, *Insects of Micronesia* 17(1): 28, fig. 8.

? *Aulacophora coffeae*, Greenwood, 1940, Linn. Soc. N. S. Wales, Proc. 65: 215; Lever, 1942, Agr. Jour. [Fiji] 13(2): 48; Evans, 1952, Injur. Insects Brit. Commonwealth: 119.

MALE: Ochraceous; metathorax, abdomen (except end of last segment), and middle and hind legs black; antenna slightly brownish on

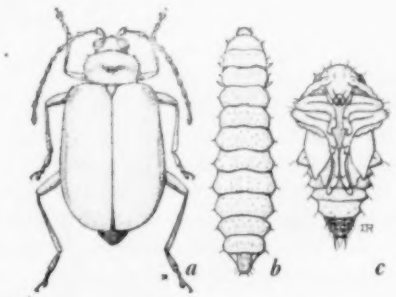

FIG. 35. *Aulacophora similis* (Oliv.): *a*, Adult male; *b*, larva, dorsal view; *c*, pupa, ventral view (Micronesian specimens, after Gressitt, 1955, *Insects of Micronesia* 17 (1): 29).

third to fifth segments, pitchy on remainder. *Head* slightly hairy and finely punctured anteriorly, smooth on occiput; *antenna* three-fourths as long as body, slender except for swollen and somewhat flattened scape; third and fourth segments oblique apically; prothorax subtrapeziform, broadest slightly behind apex, with a deep transverse depression which is widened and bent slightly backward at middle; *elytron* finely and irregularly punctured and with humeral area clothed with fine erect hairs; *last sternite* with a large concave oblong process with a deep narrow emargination on each side.

FEMALE: Antenna two-thirds as long as body; scape less swollen; pronotum less deeply grooved; humerus not pubescent; last sternite with a broad terminal emargination.

Length 6–7.5 mm.; breadth 2.6–3.6 mm.

YASAWA: Yalobi, Waya I., July 1937, St. John.

VITI LEVU: Nandi, June 1913, Illingworth; Nandovi, Singatoka, May 1915, Veitch; Waito, Tailevu, Sept. 1937, Valentine.

OVALAU: Levuka, July 1938, Zimmerman.

VANUA LEVU: Lambasa, Oct. 1955, Gressitt.

TAVEUNI: Ngathabula (Qacabula), on pumpkin, Nov. 1937, Valentine.

LAU: Ongea I., Oneata I., Komo I., Aug. 1924, Bryan.

CENTRAL FIJI: Matuku I., July 1924, Bryan; Naroi, Moala I., Aug. 1938, Zimmerman.

KANDAVU: Wai Salima, Apr. 1941, Krauss.

HOSTS: *Citrullus vulgaris* Schrad., *Cucurbita pepo* DC, *Cucumis melo* L., *C. sativus* L., and other cucurbits.

Knowles (1907) and Jepson (1911) reported *Aulacophora fabricii* Baly as damaging melons and pumpkins in Fiji. Lever (1942) reported *A. coffeae* in addition to *A. similis*, and stated that Knowles' record applies to *A. coffeae*. We have not been able to verify the records of *A. coffeae*.

Tribe GALERUCINI

Genus MALACOTHERIA Fairmaire

Malacotheria Fairmaire, 1882, Soc. Ent. de France, Ann. Ser. 6, 1: 486 (type here designated as *M. funerea* Fairm.; Fiji).

Head nearly as broad as prothorax; pronotum concave longitudinally, partly smooth; elytron finely and irregularly punctured, often carinate at side; antennal segments subequal, with second shorter.

The species below have been difficult to delimit. There are clearly at least three species, but perhaps more, for there is much variation within each series, and the material at hand does not seem to fit well with the original descriptions. This genus is found in Fiji and the Papuan subregion.

KEY TO FIJIAN SPECIES OF *Malacotheria*

1. Body less than twice as long as broad; elytron feebly carinate or not carinate . . . 2

   Body more than twice as long as broad; elytron distinctly carinate along side . . . . . **lateritia**

2. Pronotum largely smooth, subglabrous, black in center; elytron pale brown, with silvery pubescence . . . . . **funerea**

   Pronotum pubescent, in part densely punctured; elytron dull with thin golden buff or silvery buff pubescence . . . . **strigiscuta**

91. **Malacotheria funerea** Fairmaire
Fig. 36*a*

Malacotheria funerea Fairmaire, 1882, Soc. Ent. de France, Ann. Ser. 6, 1: 487 (Viti; type in Paris Mus.).

Pale brown, pitchy on occiput, central portion of pronotum, and scutellum; pubescence silvery on elytron. *Head* slightly concave on occiput, feebly punctured; *antenna* with fourth and fifth segments longest; *pronotum* concave, smooth, feebly punctured, subglabrous; *elytron* finely and irregularly punctured, distinctly broadened behind middle. Length 6.7–7.7 mm.; breadth 3.5–4.1 mm.

VITI LEVU: Mt. Victoria and Nandarivatu, Sept. 1938, Zimmerman; seven specimens.

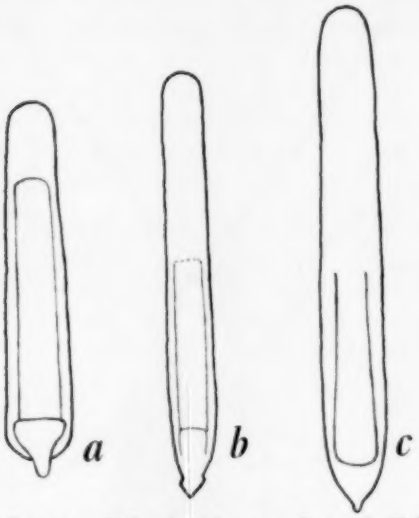

FIG. 36. *a*, *Malacotheria funerea*, aedeagus; *b*, *Malacotheria strigiscuta*, aedeagus; *c*, *Malacotheria lateritia*, aedeagus.

92. **Malacotheria strigiscuta** Fairmaire
Fig. 36*b*

Malacotheria strigiscuta Fairmaire, 1882, Soc. Ent. de France, Ann. Ser. 6, 1: 487 (Viti, Ovalau; type in Paris Mus.).

Pale brown, darker on occiput and center of pronotum; tibiae, tarsi, and antenna largely dull. *Head* concave on occiput; third antennal segment short; *pronotum* concave, distinctly punctured, pubescent, entirely pale or darkened only on center; *elytron* closely punctured, somewhat distinctly carinate at side. Length 6–7.2 mm.; breadth 2.8–3.4 mm.

VITI LEVU: Nandarivatu, Sept. 1938, Belt road, 70 km. west of Suva, July 1938, Zimmerman.

OVALAU: Thawathi, and Draiba trail, July 1938, Zimmerman.

Nine specimens.

93. **Malacotheria lateritia** Fairmaire
Fig. 36*c*

Malacotheria lateritia Fairm., 1882, Soc. Ent. de France, Ann. Ser. 6, 1: 488 (Viti; type in Paris Mus.).

Brown, paler on prothorax and ventral surfaces, nearly black on head; antenna and legs pale, annulated with darker. *Head* generally somewhat concave on occiput; *pronotum* concave, somewhat punctured, pubescent, less acute at anterior angle than in preceding two species; *elytron* finely punctured, distinctly carinate at side. Body narrower than in preceding two species. Length 5.5–7 mm.; breadth 2–2.8 mm.

VITI LEVU: Nandarivatu, Navai Mill, and Korovou, Tailevu, Sept. 1937, Valentine; Nandarivatu, ridge west of Vatuthere, Sept., Belt road 70 km. west of Suva, July 1938, Zimmerman; Lami Quarry, near Suva, May 1951, Krauss.

OVALAU: Draiba trail, Thawathi, July 1938, Zimmerman.

VANUA LEVU: Nakawanga, on *Pipturus*, Oct. 1955, Gressitt.

Thirty-one specimens.

HOST: *Pipturus argenteus* var. *lanosus* Skottsb.

Genus PLESISTIA Maulik

Plesistia Maulik, 1929, Insects of Samoa 4(3): 198 (type: *P. brunnea* Maulik; Samoa, Fiji).

Antenna reaching middle of elytron, first and fourth segments long; prothorax transverse, side rounded, each angle with a seta; elytron with ten ribs including a short scutellar one, the suture raised and alternate ribs more strongly raised; fore coxal cavity closed; tarsal claw with angular projection at base.

94. **Plesistia brunnea** Maulik

Plesistia brunnea Maulik, 1929, Insects of Samoa 4(3): 199, figs. 10, 11 (Samoa, Fiji; type in Brit. Mus.).

Gray-brown; last eight antennal segments black above; legs pitchy distally. *Head* impunctate, grooved medially; scape long, clavate; second antennal segment shorter than third; *prothorax* flattened, with shallow depressions; *elytron* ribbed. Length 8 mm.

VITI LEVU: Thuvu (Cuvu). Korovou, Tailevu, Sept. 1937, Valentine; ten specimens.

Samoa (type locality).

There is some question as to whether the species was introduced from Samoa to Fiji, or vice versa.

Tribe LUPERINI

Genus HAPLOSOMOIDES Duvivier

Haplosomoides Duviv., 1890, Soc. Ent. de Belg., C. R. 34: XXXIV (type: *Rhaphidopalpa serena* Boheman; E. Indies).

Elongate; head larger than prothorax; antenna slender; prothorax trapeziform, wider at apex, constricted and transversely grooved; elytron long, swollen near scutellum, deeply punctured in center; tarsal claws appendiculate.

95. ***Haplosomoides binotata*** Bryant, n. sp.

Fig. 37

Narrow and elongate; head, antenna, prothorax, legs, and underside fulvous; elytron shining dark brown or blackish, with two median flavous patches, a fulvous stripe from the shoulder, and the suture narrowly fulvous not extending to the apex.

Head fulvous, nitid, impunctate, a transverse depression between eyes; eye somewhat prominent. *Antenna* fulvous, extending to middle of elytron, first segment longest, about three times as long as second; third to sixth about equal; third about twice as long as second; four apical segments each slightly shorter than sixth. *Prothorax* slightly transverse, fulvous; side margined and narrowly fuscous; anterior portion slightly broader than head; side margin contracted to base. *Scutellum* fulvous, large, triangular. *Elytron* elongate and narrow, feebly costate at side, slightly broadening to apex, which is rounded; dark shining brown with a median flavous patch, joined to shoulder by a fulvous stripe; suture narrowly fulvous not extending to apex, covered with large shallow punctures. *Legs* and underside fulvous; tarsus with first segment elongate, equal to remainder. Length 4 mm.

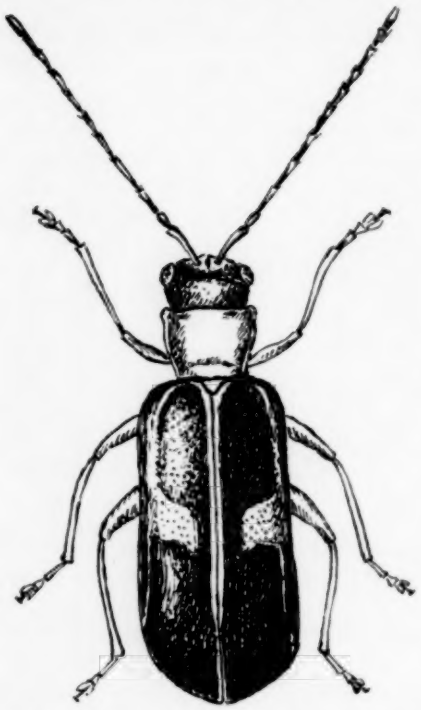

FIG. 37. *Haplosomoides binotata* Bryant, n. sp., type.

VITI LEVU: Holotype (BISHOP 2447), Nandarivatu, Sept. 6, 1938, 1100 m., Zimmerman; five specimens. Tholo-i-suva, July 25, 1938, Zimmerman; one specimen.

OVALAU: Andubangda, July 15, 1938, Zimmerman.

A very distinct species on account of its pattern. Allied to *Mimastra costata* Baly from Formosa, which Ogloblin has placed in the genus *Haplosomoides*.

Genus KHASIA Jacoby

Khasia Jacoby, 1899, Entomologist 32: 83 (type: *Khasia kraatzi* Jac.; S. India).

Head nearly as broad as prothorax; prothorax narrowed posteriorly; elytron short, narrowed or oblique apically; hind wing lacking.

The following do not fit perfectly in this

genus, and in some ways are closer to *Shaira* Maulik.

KEY TO FIJIAN SPECIES OF *Khasia*

1. Elytron distinctly rounded apically, somewhat smooth 2

   Elytron obliquely truncate apically, rugose 3

2(1). Prothorax with anterior angle forming a right angle; pronotum distinctly punctured; elytron carinate on humerus, sinuate at side, punctured basally . . . . . **nigra**

   Prothorax with anterior angle obtuse; pronotum feebly punctured; elytron smooth on humerus, evenly rounded at side, almost impunctate . . . . . **nitida**

3(1). Pronotum almost entirely rugose-punctate . . . . . **r. rugosa**

   Pronotum with a transverse central area raised and almost impunctate . . . . . **r. callosa**

96. **Khasia nigra** Bryant

Khasia nigra Bryant, 1925, Ann. and Mag. Nat. Hist. Ser. 9, 15: 598 (Nausori; type in Brit. Mus.).

Black, shiny, slightly metallic, except for antennal base, femora, coxae, metasternum, and last abdominal sternite, which are fulvous. *Head* broad, rugose; *antenna* reaching elytral apex; scape long, broadening to apex, stouter than remainder; third longer than second; *prothorax* about as broad as long, very rugose, side constricted towards base; *elytron* widened towards apex, slightly rugose, basal half more so than apical, but much smoother than prothorax, longitudinally deeply impressed from shoulder for half length of elytron; side costate from humerus to just before apex; apex rounded; first four abdominal sternites feebly punctured. Length 3.5 mm.

VITI LEVU: Nausori (type locality). Tholo-i-suva (Colo-i-suva), June 1924, Bryan, July 1938, Zimmerman; Apr. 1951, Krauss; Naivithula, Tailevu, Sept. 1937, Valentine; Lami, Mar. 1951, Krauss; 20 specimens.

OVALAU: Andubangda and Draiba trail, July 1938, Zimmerman; two specimens.

97. ***Khasia nitida*** Bryant, n. sp.
Fig. 38

Shining brown, head and prothorax impunctate, elytron very feebly punctate-striate; four segments of abdomen exposed, nitid and impunctate; antenna and legs pale brown.

Head pale brown, nitid, transversely impressed between eyes, with a median longitudinal impression on basal half impunctate. *Antenna* extending well beyond base of elytron; first segment more dilated and longer than second; third slightly longer than second; third to eleventh all about equal, pale brown, terminal segments slightly pubescent. *Prothorax* pale brown, nitid, impunctate, slightly transverse, widest about middle, slightly contracted in front and more so at base, slightly broader than head; base as

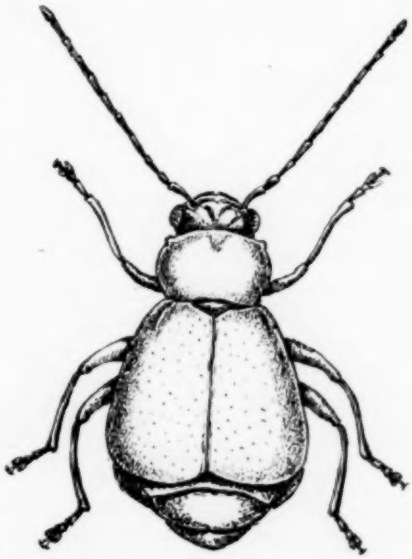

FIG. 38. *Khasia nitida* Bryant, n. sp., type.

broad as elytra at bases; basal margin slightly contracted in middle. *Scutellum* transverse, pale brown, nitid. *Elytron* pale brown with a broad longitudinal fuscous patch, gradually broadening to the rounded apex, very finely and not closely punctured. *Abdomen* exposed in both sexes, more so in the female. *Legs* and underside pale brown. Length 3.5–5 mm.

VITI LEVU: Holotype (BISHOP 2448), Nandarivatu, 1100 m., Sept. 10, 1938, Zimmerman. Eight paratypes (BISHOP, BM): Navai Mill, Nandarivatu, Oct. 13, Valentine; Navai-Nasonga trail, 1000 m., Sept. 12, 1938, Zimmerman; Mt. Korombamba, Aug. 1, 1938, Zimmerman; Lami, Mar. 1951, Krauss.

Differs from *K. nigra* Bryant in color, and in not being rugosely punctured.

93. ***Khasia rugosa rugosa*** Bryant, n. sp.
Fig. 39

Dull brown; head black, prothorax and elytron with side margins broadly black, in some extending to suture; entirely rugosely punctured; legs fulvous with apical third black.

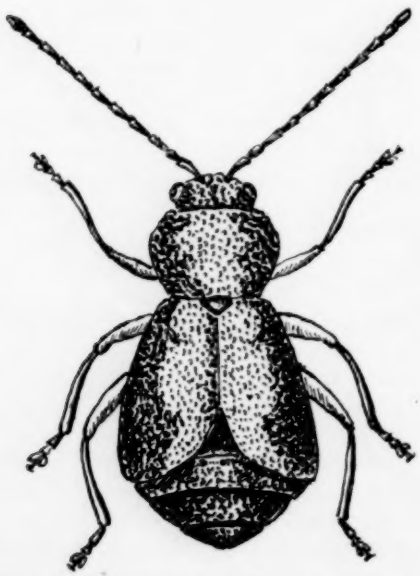

FIG. 39. *Khasia rugosa rugosa* Bryant, n. sp., type.

Head black, very rugosely punctured; *antenna* extending slightly beyond base of elytron, fulvous with apical segments tinged with fuscous; first segment longest, about twice as long as second. *Prothorax* dull brown with side margin broadly black; slightly transverse, widest just before middle, contracted to base, very strongly and rugosely punctured. *Scutellum* dull brown, impunctate. *Elytron* dull brown with side margin broadly black, in some extending to suture, rugosely punctured; punctures close and irregular; about as wide as base of prothorax, and gradually broadening to apex, somewhat truncate at apex and contracted upwards to suture, exposing two rugosely punctured abdominal segments. *Legs* fulvous with apical third of each tibia black. *Underside* with ventral segments of abdomen not so rugosely punctured.

VITI LEVU: Holotype (BISHOP 2449), Nandarivatu, Sept. 11, 1938, 800 m., Zimmerman, eight specimens; Tholo-i-suva, 175 m., July 21, 1938, Zimmerman, five specimens; Mt. Korombamba, 400 m., Aug. 1, 1938, Zimmerman, two specimens.

OVALAU: Thawathi, July 16, 1938, Zimmerman.

Easily distinguished from the other two species from Fiji by its very rugose appearance.

99. ***Khasia rugosa callosa*** Gressitt, n. subsp.

MALE: Black; antenna partly brownish in basal third; central portion of pronotum, from apex to base, testaceous; scutellum and base of elytron testaceous; thoracic sterna, coxae, and femora and tibiae (except apices of both) testaceous.

Head short, deeply punctured. *Antenna* reaching beyond middle of elytron; scape nearly as long as next two combined; fourth longer than any of succeeding. *Prothorax* broader than head, subhexagonal, widest at middle; disc with a broad, nearly impunctate area across central portion, the area partly divided into three portions; remainder densely rugose-punctate. *Scutellum* swollen. *Elytron*

less than twice as long as broad, obliquely truncate apically, densely rugose-punctate. Length 2.5 mm.; breadth 1.6 mm.

VANUA LEVU: Holotype, male (BISHOP 2450), Nakawanga, center of island, at 70 m., Oct. 8, 1955, Gressitt; paratopotype, male, Oct. 9, Gressitt.

Differs from the preceding in having a broad impunctate callus across the center of the pronotum, the elytron more shiny and more coarsely rugose, and the pale markings more restricted.

Genus CEROPHYSA Chevrolat

Cerophysa Chevrolat, 1837, in Dejean, Cat. Col. ed. 2: 379; ed. 3: 403; 1843, IN d'Orbigny, Dict. Univ. Hist. Nat. 3: 339 (type: *Galleruca nodicornis* Wiedem.; Java); Chapuis, 1875, Gen. Col. 11: 181.

Ozomena Chevrolat, 1845, Dict. Univ. Hist. Nat. 4: 5.

Head large, almost as broad as prothorax; antenna long, cylindrical, with ninth segment greatly enlarged in male; prothorax trapeziform, broader distally, transversely grooved; elytron finely and irregularly punctured.

This is an Oriental genus.

100. **Cerophysa vitiensis** Bryant

Cerophysa vitiensis Bryant, 1941, Ann. and Mag. Nat. Hist. Ser. 11, 8: 103, fig. 2 (Tamavua; type in Brit. Mus.).

Head, thorax and abdomen ochraceous, paler beneath; elytron black; antenna reddish brown, nearly black on ninth segment; legs ochraceous to pale brown. *Head* smooth and shiny above; *antenna* with second segment short, and ninth in male very broad, obliquely concave subapically; *prothorax* smooth, shiny, nearly impunctate; *elytron* with puncturation fine, but somewhat variable. Length 7–8 mm.; breadth 3.2–4 mm.

VITI LEVU: Korovou, Tailevu, Aug. 1937, Valentine; ridge west of Vatuthere, 800 m., Sept., and Tholo-i-suva, July 1938, Zimmerman.

VANUA LEVU: Nakawanga, 80 m., on *Gironniera*, Oct. 1955, Gressitt.

HOST: *Gironniera celtidifolia* Gaud.

Tribe MONOLEPTINI

Genus MONOLEPTA Erichson

Monolepta Er., 1843, Arch. f. Naturgesch. 9(1): 265 (type: *M. pauperata* Er.; Africa).

Subgenus METRIOIDEA Fairmaire

Metrioidea Fairm., 1882, Soc. Ent. de France, Ann. 50: 489 (type: *M. signatipennis* Fairm.; Fiji).

It is not certain that *Metrioidea* should be a subgenus of *Monolepta*. Yet all the species below seem to be structurally very closely related, and to differ from typical species of *Monolepta* in very minor respects, other than having the tibial spines minute. In addition to the type species, three species from the Malay subregion and Ceylon have previously been assigned to *Metrioidea*.

KEY TO FIJIAN SPECIES OF *Metrioidea*

1. Length of body over 2.8 mm.; dorsum pale with generally some vague oblique or irregular dark streaks 2

   Length of body less than 2.7 mm.; dorsum black to brown, sometimes with pale spots, but without dark streaks 4

2(1). Pronotum generally pale and without distinct dark markings; elytron rarely with distinct dark markings; length less than 3.4 mm. 3

   Pronotum with a pair of longitudinal pitchy stripes on center, and generally other dark markings; elytron with two incomplete dark bands; length 3.5–5 mm. . . . . **s. signatipennis**

3(2). Ochraceous, with generally a few vague dark markings; length 2.6–3.4 mm. . . . . **s. lauana**

   Testaceous, almost entirely pale; length 2.4–3.2 mm. . . . . **s. kandavuna**

4(1). Dorsum black to pitchy brown, rarely with one or two pale areas on elytron; pronotum distinctly punctured; main islands 5

Dorsum uniformly castaneous brown, rarely a little paler or darker; pronotum generally feebly punctured or nearly impunctate; in Moala . . . . . **moala**

5(4). Dorsum entirely black, or black with one or two pale areas on elytron; pronotum sparsely punctured . . . **vitiensis**

Dorsum pitchy red-brown; pronotum rather closely punctured . **zimmermani**

101. *Monolepta (Metrioidea) signatipennis* (Fairmaire), n. comb.

Metrioidea signatipennis Fairm., 1882, Soc. Ent. de France, Ann. Ser. 6, 1: 489 (Viti, Ovalau; type in Paris Mus.).

Pale brown: head darker on median line; pronotum with a pair of short longitudinal lines, or a "V," on center and more or less dark at side; elytron partly dark on suture and with two broad, incomplete dark bands, one just anterior to middle, other near apex, and a lesser mark behind humerus; metathorax somewhat dark. *Head* a little narrower than prothorax; eye very large, feebly emarginate; *antenna* slender, two-thirds as long as body, with scape longer than next two segments combined, and fourth nearly as long as scape; *prothorax* a little broader than long, slightly rounded at side, truncate anteriorly, strongly rounded basally, with disc even and feebly punctured; *elytron* finely and irregularly punctured, rounded apically. Length 3.5–5 mm.; breadth 2.3–2.6 mm.

VITI LEVU: Mt. Victoria and Nandarivatu, Sept. 1938, Zimmerman; Mt. Korombamba, Aug. 1938, Zimmerman; Belt road, 25 km. west of Suva, July 1938, Zimmerman; ridge west of Vatuthere, Sept. 1938, Kondo.

OVALAU: Draiba trail, Andubangda, and near Vuma, July 1938, Zimmerman.

Forty specimens.

102. *Monolepta (Metrioidea) signatipennis lauana* Gressitt, n. subsp.

Testaceous, somewhat more ochraceous above, with slightly darkened side of pronotum, and three feeble, incomplete, elytral bands.

Head with frons punctured at side and occiput quite smooth. *Antenna* three-fourths as long as body, with second and third segments subequal. *Prothorax* a little broader than long, rounded-obtuse at side, widest one-third from apex; disc finely punctured, in part impunctate. *Elytron* finely punctured, distinctly broadened preapically. Length 3.3 mm.; breadth 2 mm.

PARATYPES: Length 2.6–3.4 mm.; breadth 1.5–2.1 mm.

LAU: Holotype (BISHOP 2451) Bavatu, Vanua Mbalavu I., N. Lau Group, Aug. 16, 1938, Kondo. Fifteen paratypes (BISHOP, BM, US): Buthalevu, Vanua Mbalavu, 75 m., Aug. 10, 1938, Zimmerman; Mvana, Vanua Mbalavu, at seashore, Aug. 9, 1938, Zimmerman; Loma Loma, Vanua Mbalavu, Aug. 5, 1938, Zimmerman; Mbavatu, Vanua Mbalavu, Aug. 16, 1938, Zimmerman; Thikombia I., Sept. 26, 1924, Bryan; Navutu-i-loma, Aug. 10, 1924, Bryan; Yuvutha, Yangasa Cluster, Aug. 11, 1924, Bryan; 2 km. south of Narona, Mango I., Aug. 14, 1938, Zimmerman.

Differs from the typical form in being distinctly smaller, with feebler markings, and in having the side of the prothorax more obtuse.

103. *Monolepta (Metrioidea) signatipennis kandavuna* Gressitt, n. subsp.

Pale ochraceous, still paler on abdomen and hind femur, slightly darker on parts of hind thorax, median line of vertex and occiput, and side of pronotum.

Head nearly as broad as prothorax, smooth. *Prothorax* rounded-obtuse at side, broadest one-fourth from apex, feebly and irregularly punctured. *Elytron* finely punctured. Length 3.15 mm.; breadth 1.65 mm.

PARATYPES: Length 2.4–3.2 mm.; breadth 1.2–1.8 mm.

KANDAVU: Holotype (BISHOP 2452), Yawi, Apr. 28, 1941, Krauss. Eighteen paratypes (BISHOP, BM, US, CSIRO, CAS): two paratopotypes, same data; remainder Tiliva and Wai Salima, Apr. 30, 1941, Krauss.

Differs from the preceding subspecies in being still smaller, slightly paler, and almost without dark markings, thus differing from the typical form in being much smaller and almost one-colored.

104. *Monolepta (Metrioidea) moala* Gressitt, n. sp.

MALE: Reddish castaneous, paler on front of head; antenna and legs testaceous. Body subglabrous above, with a few fine pale hairs on elytral border; antenna, legs, and ventral surfaces with short sparse oblique pale hairs.

Head a little narrower than prothorax, about as broad as long, impunctate, with a pair of transverse swellings on vertex, smooth on occiput. *Antenna* three-fourths as long as body, slightly flattened beyond fifth segment; scape slightly longer than, and fourth subequal to, second and third segments combined; following subequal. *Prothorax* nearly as long as broad, obtusely rounded at side, broadest one-fourth from apex, broader at apex than at base, truncate anteriorly and convex basally, in outline; disc even, smooth, feebly punctured. *Scutellum* triangular. *Elytron* broadest in apical third, singly rounded apically; disc finely, irregularly, and not very closely punctured. Length 2.75 mm.; breadth 0.93 mm.

FEMALE: Body broader, a little more heavily punctured. Length 2.45 mm.; breadth 1.4 mm.

PARATYPES: Length 1.6–2.5 mm.; breadth 0.9–1.4 mm.

CENTRAL FIJI: Holotype, male (BISHOP 2453), Matuku, Moala Group, July 6, 1924, Bryan; allotopotype (BISHOP), July 4. Thirty-seven paratopotypes (BISHOP, BM, US, CSIRO, CAS): July 4–6, 1924, Bryan.

Differs from *M. signatipennis* (Fairm.) in being smaller, more convex, darker and more uniformly colored.

105. *Monolepta (Metrioidea) zimmermani* Bryant, new name

Monolepta modesta Bryant (nec Blackburn), 1925, Ann. and Mag. Nat. Hist. Ser. 9, 15: 599 (Lautoka; type in Brit. Mus.).

Black to pitchy brown, nitid; prothorax with greenish reflections; antenna, tibiae, and tarsi flavous. *Head* smooth; *antenna* with fourth segment about equal to scape, fifth a very little shorter than fourth; *prothorax* nitid, rather strongly punctured, narrower than elytral base, slightly broader than long, very little contracted at base, from middle slightly converging to apex; *elytron* strongly and rather closely punctured, punctures about as strong as those on prothorax, side gradually widening from base to beyond middle and there rounded to apex; *abdominal sterna* feebly punctured and slightly pubescent.

FEMALE: With second and third antennal segments slightly longer. Length 2.4–2.7 mm.; breadth 1.15–1.3 mm.

VITI LEVU: Lautoka (type loc.). Tholo-i-suva (Colo-i-suva), June 1924, Bryan; Natabakula, near Singatoka, Apr. 1941, Krauss.

OVALAU: Wainiloka, Draiba trail, July 1938, Zimmerman; four specimens.

A specimen from Kalambu, near Suva, Apr. 1941, Krauss, does not agree in puncturation.

106. **Monolepta (Metrioides) vitiensis** Bryant

Monolepta vitiensis Bryant, 1925, Ann. and Mag. Nat. Hist. Ser. 9, 15: 599 (Labasa; type in Brit. Mus.).

Blackish brown, nitid; antenna, frons, legs, humeri, and venter testaceous. *Head* smooth, a transverse impression between eyes; *antenna* filiform, reaching beyond middle of elytron; scape long, slightly curved, longer than second and third segments combined, second and third subequal, second slightly more swollen than third, fourth equal to second and third combined; *prothorax* strongly punctured, much narrower than elytra, very little broader than long, side nearly straight;

elytron closely punctured, but less strongly so than on prothorax, slightly depressed behind shoulder, broadest behind middle, rounded at apex; *abdominal sternites* slightly pubescent; first hind tarsal segment longer than rest. Length 2.2–2.5 mm.; breadth 1–1.2 mm.

VANUA LEVU: Lambasa (type loc.). Nakawanga, 45 m., on *Inocarpus*, Oct. 1955, Gressitt; 15 specimens.

HOST: *Inocarpus fagiferus* (Parkinson) Fosberg.

This species is apparently variable in color. All of the ten females in the above series are entirely black above; two of the males are entirely black above; one male has only the humerus pale, as in the type series; and two males have two large pale spots on the elytron. This species was observed to jump.

Subfamily *ALTICINAE*

KEY TO FIJIAN GENERA OF ALTICINAE

1. Antenna of 11 segments 2
   Antenna of 10 segments . . **Psylliodes**

2(1). Anterior coxal cavity open behind . . . 3
   Anterior coxal cavity closed or nearly closed behind; pronotum with basal depressed area . . . . . **Crepidodera**

3(2). Pronotum with a depression parallel to basal margin 4
   Pronotum without a depression parallel to basal margin 6

4(3). Elytral punctures in regular rows; body length less than 3 mm. 5
   Elytral punctures irregular; body length about 5 mm. . . . . **Altica**

5(4). Prothorax transverse, rounded at side . . . . . **Manobia**
   Prothorax nearly as long as broad, subtrapeziform, broadest apically . . . . . **Alema**

6(3). Elytral punctures irregular or obsolete; body length generally less than 2 mm. 7
   Elytral punctures generally in regular rows; body length 3 mm. or more. **Febra**

7(6). Posterior tibia not depressed at apex, which is rounded and furnished with a small spinule placed in the middle of the terminal border 8
   Posterior tibia depressed at apex, which is divided into two very short lobes, each usually ending in a short spinule . . . . . **Aphthona**

8(7). Second antennal segment more slender than scape; prosternal intercoxal process narrow . . . . . **Phyllotreta**
   Second antennal segment as stout as scape; prosternal intercoxal process broad, concave . . . . . **Nesohaltica**

Genus PHYLLOTRETA Stephens

Phyllotreta Stephens, 1839, Man. Brit. Col.: 291 (type: *Chrysomela nemorum* L.; Europe); Maulik, 1926, Fauna of India, Col. Chrys. Halt.: 377.

Head as broad as prothorax; eye small; interantennal carina short; antenna reaching middle of elytron; scape clavate, second and third segments small; prothorax transverse, slightly rounded at side; elytron as a rule confusedly punctate; prosternum very narrow; fore coxal cavity open; hind tibia not channelled and with a small apical spine; first hind tarsal segment equal in length to remaining combined.

107. **Phyllotreta blackburni** Bryant

Phyllotreta blackburni Bryant, 1925, Ann. and Mag. Nat. Hist. Ser. 9, 15: 596 (Nadar, Cuvu; type in Brit. Mus.).

Bronzy black; five basal segments of antenna and bases of tibiae testaceous; elytron with a yellow discal stripe, bent in at base and dilated at apex. Dorsum closely and finely punctured.

VITI LEVU: Nandar; Thuvu.
New Hebrides.

Genus APHTHONA Chevrolat

Aphthona Chevr., 1842, IN d'Orbigny, Dict. Univ. Hist. Nat. 2: 5; Maulik, 1926, Fauna of India, Col. Chrys. Halt.: 366 (type *Altica cyparissiae* Koch; Europe).

Head with vertex impunctate, often tuberculate; antenna reaching middle of elytron; scape long and clavate; eye oval, prominent; prothorax transverse, without a basal transverse depression; elytron oblong, rounded at apex, finely and confusedly punctate; anterior coxal cavity open; hind tibia dilated from base to apex, outer side flat with edges set with fine bristles, and outer edge sometimes with spinules, apex often ending in a spine on outer side; first hind tarsal segment distinctly less than half as long as tibia.

KEY TO FIJIAN SPECIES OF *Aphthona*

1. Dorsum black or blackish, rather distinctly punctured 2

   Dorsum reddish testaceous, nearly impunctate . . . . . **veitchi**

2(1). Pronotum rather sparsely punctured. 3

   Pronotum rather closely punctured; dorsum greenish black, somewhat purplish on posterior portion of elytron; appendages dull reddish to slightly pitchy; length 2.9 mm. . . . . **lamia**

3(2). Pronotum strongly punctured, with a mid-basal longitudinal impression; hind femora black; length 2 mm. . . . . **greenwoodi**

   Pronotum finely punctured without a longitudinal impression; hind femora reddish; length 1.6 mm. . . . . **senetiki**

108. **Aphthona veitchi** Bryant

Aphthona veitchi Bryant, 1925, Ann. and Mag. Nat. Hist. Ser. 9, 15: 595 (Cuvu; Lautoka; type in Brit. Mus.). Greenwood, 1940, Linn. Soc. N. S. Wales, Proc. 65: 215.

Flavous, shiny; labrum, apical antennal segments and hind femur darker. *Head* smooth, shiny; frons carinate between antennal insertions; *antenna* reaching middle of elytron; scape equal in length to next two segments combined; fifth slightly longer than either fourth or sixth; *prothorax* smooth, shiny, a little broader than long, slightly rounded at side; *elytron* slightly dilated beyond middle, very feebly punctured; first hind tarsal segment equal to next two combined. Length 2 mm.

VITI LEVU: Thuvu; Lautoka.

OVALAU: Andubangda, Aug. 1938, Zimmerman; questionably this species.

HOST: Adult feeds on leaves of *Euphorbia chamissonis* Boiss (after Greenwood).

109. **Aphthona greenwoodi** Bryant

Aphthona greenwoodi Bryant, 1925, Ann. and Mag. Nat. Hist. Ser. 9, 15: 595 (Loloti; type in Brit. Mus.).

Black, shiny; labrum, antenna, fore and middle legs and hind tibia fuscous. *Head* finely punctured; *antenna* with first two segments about equal and thicker than following; *prothorax* transverse, with anterior angles oblique, strongly but sparsely punctured, a feeble longitudinal impression in middle at base; *elytron* strongly and irregularly punctured. Length 2 mm.

VITI LEVU: Loloti.

110. ***Aphthona lamia*** Gressitt, n. sp.

MALE: Metallic greenish black above, in certain lights dull purplish on inner half of posterior two-thirds of elytron, and particularly so on ectoapical portion of elytron; front of head, ventral surfaces, and appendages largely testaceous; hind leg more reddish ochraceous.

Body broad. *Head* finely punctured in front, nearly impunctate on occiput. *Antenna* two-thirds as long as body, slender; scape a little longer, and a little stouter, than second segment; third as long as second, but more slender; fourth slightly longer than third, slightly shorter than fifth. *Prothorax* less than

two-thirds as long as broad, strongly convex, deeply and rather closely punctured, all four corners prominent. *Scutellum* rounded-triangular, nearly smooth. *Elytron* deeply, somewhat closely, and irregularly punctured, the punctures slightly finer apically; suddenly narrowed, and declivitous, apically. *Ventral surfaces* in part finely punctured. *Hind femur* nearly reaching to abdominal apex; hind tibia shallowly concave behind; first hind tarsal segment nearly as long as remainder combined. Length 1.8 mm.; breadth 1.2 mm.

FEMALE: Antenna one-half as long as body. Length 2.9 mm.; breadth 1.6 mm.

VITI LEVU: Holotype, female (BISHOP 2455), Lami Quarry, near Suva, May 1951, Krauss; allotype, female, Tholo-i-suva, Jan. 1955, Krauss; 9 paratopotypes, May 1951, Krauss; one paratype, Navai, Sept. 1950, Krauss; one, Tholo-i-suva, Apr. 1951, Krauss.

Differs from *A. greenwoodi* Bryant in being much larger, greenish instead of black, with the pronotum closely punctured, and the hind femur reddish instead of black.

111. ***Aphthona senetiki*** Gressitt, n. sp.
Fig. 40

FEMALE: Body shiny black to pitchy black above, dark reddish pitchy beneath; slightly pitchy on elytral disc; head pitchy anteriorly; eye pinkish silvery; antenna and fore and middle legs testaceous, in part tinged with pitchy; hind legs reddish castaneous.

Body narrow. *Head* largely impunctate, with a subtransverse groove behind a pair of swellings immediately behind antennal insertions. *Antenna* two-thirds as long as body, distinctly thickened distally; scape moderately stout, a little longer than second segment; third longer than second, and more slender; fourth to tenth subequal to third; last longer and much stouter. *Prothorax* three-fifths as long as broad, rounded at side, corners not very prominent, finely and sparsely punctured. *Scutellum* short, rounded-triangular. *Elytron* nearly three times as long as head and prothorax combined, distinctly, and irregularly

FIG. 40. *Aphthona senetiki* Gressitt, n. sp., type.

punctured throughout, the punctures mostly about as large as interspaces. First hind tarsal segment nearly as long as remaining combined. Length 1.6 mm.; breadth 0.95 mm.

VANUA LEVU: Holotype, female (BISHOP 2456), between Navakuru and Nakawanga, 400 m., Oct. 7, 1955, Gressitt.

Differs from *A. greenwoodi* Bryant in being smaller, more parallel-sided, with the hind femur reddish, the pronotum much more finely punctured, and without a longitudinal impression, and with the elytron a little more finely punctured. Named for Senetiki, government agricultural assistant, who accompanied me on the walk across Vanua Levu.

Genus ALTICA Müller

Altica Müller, 1764, Fauna Ins. Fridrichsdal.: XIV; Fabricius, 1775, System. Ent. :112.

Haltica Koch, 1803, Ent. Hefte 2: 5 (type: *Chrysomela oleracea* L.; Europe); Maulik, 1926, Fauna of India, Col. Chrys. Halt.: 418.

Head with frontal tubercles and a sharp frontal ridge; second and third antennal segments of equal thickness; third and fourth subequal in length; pronotum with deep transverse basal depression with a longitudinal groove at each end, elytron irregularly punctured; fore coxal cavity open.

112. **Altica corusca** Erichson

Haltica corusca Erichson, 1842, Arch. f. Naturgesch. Ser. 8, 1: 235; (Tasmania); Blackburn, 1896, Roy. Soc. S. Australia, Trans. 20: 73, 75.

Haltica gravida, Veitch and Greenwood, 1921, Linn. Soc. N. S. Wales, Proc. 46: 511.

Black, slightly tinged with purplish to bronzy. *Head* slightly shagreened, with a pair of feeble swellings between eyes; *antenna* with segments of equal thickness, and of equal length except for second which is half as long as others; prothorax micropunctulate, feebly grooved basally; *elytron* finely and irregularly punctured; *ventral surfaces* rather hairy. Length 4.2–5 mm.

LARVA: Dark brown to blackish; head blackish, paler at side; antenna and clypeus largely whitish; about 18 hairs on each side of head. Body with swollen areas dark brown and less sclerotized areas pale brown; pronotum somewhat generally sclerotized, with a strong basal transverse swelling, each side with seven bristles anteriorly and three basally; mesonotum and metanotum each with central, anterior, and posterior transverse swellings, each with a pair of bristles, a sublateral basal transverse swelling with two bristles, and a lateral swelling with three bristles, besides a small additional anterior spot on metanotum; first seven abdominal tergites each with anterior and posterior central transverse swelling with a pair of bristles, five sublateral tubercles each with one bristle, and a lateral swelling with two bristles. Length 8 mm. (Larva from Lami, Krauss.)

VITI LEVU: Nandarivatu, Navai Mill, Tholoi-suva, Matawailevu, Zimmerman; Suva, Singatoka, Valentine; Matawailevu, St. John; Vunindawa, Lami, Ndeumba, Krauss; Nandi, Koronivia, Gressitt.

OVALAU: Thawathi, near Vuma, Wainiloka, Zimmerman, Bryan.

VANUA LEVU: Wailevu, Gressitt.

LAU: Lakemba I., Bryan.

KANDAVU: Vambea, Ono I., Krauss.

Tasmania, New Hebrides, Fiji. Four hundred specimens from Fiji.

HOST: *Jussiaea villosa* (*J. repens*), *J. suffruticosa* L., *Oryza sativa* L., on growing leaf tips of rice (Lever).

Genus CREPIDODERA Chevrolat

Crepidodera Chevrolat, 1844, IN d'Orbigny, Dict. Univ. Hist. Nat. 4: 441 (type: *Chrysomela nitidula* L.); Chapuis, 1875, Gen. Col. 11: 53.

Head deeply inserted in prothorax; antenna with terminal segments slightly thickened; pronotum with a deep transverse groove near base, the groove delimited at each end by a depression or short longitudinal groove; elytra seriate-punctate.

KEY TO FIJIAN SPECIES OF *Crepidodera*

1. Body largely pale 2

   Body largely black or metallic, at least on elytra 3

2(1). Body entirely pale; pronotum finely punctured; elytron heavily punctured . . . . . **elongata**

   Distal antennal segments, suture, and side of elytron dark; pronotum impunctate; elytron feebly punctured . . . . . **evansi**

3(1). Dorsum uniformly black 4

   Prothorax differently colored from elytra 5

4(3). Prothorax deeply grooved; body twice as long as broad; a distinct postbasal elytral swelling . . . . . **fijiensis**

Prothorax shallowly grooved; body less than twice as long as broad; elytron even basally . . . . . **rotunda**

5(3). Pronotum greenish black; elytron metallic purplish, with a heavily punctured depression behind postbasal swelling . . . . . **kraussi**

Pronotum testaceous; elytron brownish black, with a moderately punctured depression behind postbasal swelling . . . . . **oceanica**

113. ***Crepidodera oceanica*** Gressitt, n. sp.
Fig. 41*a*

FEMALE: Fore body testaceous; antenna slightly dull distally; elytron pitchy purplish brown, slightly paler posteriorly; metathorax, abdomen, and hind femur pitchy red-brown; hind tibia and tarsus testaceous. Subglabrous above, with a few pale hairs on apical margin of elytron; appendages with short pale hairs, and last abdominal segment with a few at side.

Head nearly as broad as long, strongly carinate medially on frons and vertex, nearly impunctate on occiput. *Antenna* fully two-thirds as long as body; scape distinctly longer than second segment, subequal to third; third longer than fourth and shorter than fifth; sixth to tenth subequal to third; last longer. *Prothorax* nearly three-fourths as wide as elytra at humeri, just over two-thirds as long as broad, about as broad at apex as at base, moderately rounded at side, straight on anterior margin and convex and sinuate basally; disc nearly impunctate, sinuately grooved subbasally. *Scutellum* triangular. *Elytron* three and one-half times as long as prothorax, slightly broadened behind humerus, narrowed apically; disc with ten rows of fairly regular rows of punctures continuing to behind middle, the punctures mostly smaller than interspaces, and also minute punctures in the interspaces. *Ventral surfaces* largely impunctate, with a few vague punctures, and some microreticulation, on abdomen. *Legs* with hind femur very stout, and hind tibia

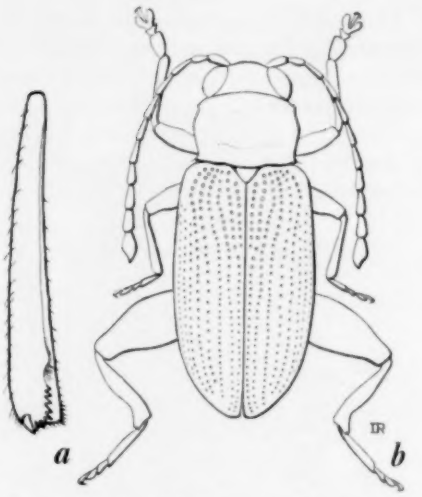

FIG. 41. *a*, *Crepidodera oceanica* Gressitt, n. sp., dorsolateral view of left hind tibia; *b*, *Crepidodera elongata* Gressitt, n. sp., type.

feebly arched, flat above, with several slender teeth on each upper margin at apex, besides a short stout tooth on outer side at end; hind tarsus with first segment one-half again as long as remainder combined. Length 3.25 mm.; breadth 1.4 mm.

MALE: Elytron less attenuated apically. Length 2.5 mm.; breadth 1.25 mm.

PARATYPES: Length 2.4–3.2 mm.; breadth 1.1–1.4 mm.

VITI LEVU: Holotype, female (BISHOP 2457), Lami Quarry, near Suva, May 1951, Krauss; allotopotype, male (BISHOP), same data. Sixty-six paratopotypes (BISHOP, BM, US, CSIRO, CAS), May 1951, Jan. and Mar. 1955, Krauss.

Differs from *C. dimidiata* Baly in having the scutellum "V"-shaped instead of "U"-shaped, the minute punctures on elytral interspaces more distinct, the hind tibia narrower and straighter, the first hind tarsal segment longer, instead of shorter, than remaining segments combined, and the hind tibia and tarsus pale instead of dark. I am indebted to Mr. Zimmerman for the comparative notes. Bryant (1936: 251) referred to *C. dimidiata* as occur-

ring in Fiji, but probably this species was involved. Some of the specimens are quite brown on the inner portion of the elytral disc. One specimen with longer, entirely blue, elytron probably represents another species.

114. *Crepidodera elongata* Gressitt, n. sp. Fig. 41*b*

MALE: Testaceous, slightly more ochraceous on thoracic and abdominal sterna and on side and preapical portion of elytron.

Body narrow; tarsi long. *Head* long; frons short and tuberculate; upper surface smooth, nearly impunctate. *Antenna* three-fourths as long as body; scape nearly one-half again as long as second segment, both stout; third nearly as long as scape, barely longer than fourth; fifth fully as long as scape, longer than each of sixth to tenth; last several thickened; last thicker than scape. *Prothorax* slightly broader than long, subrectangular, slightly sinuate at side; disc minutely punctured, distinctly grooved subbasally. *Scutellum* rounded triangular. *Elytron* long, subparallel, moderately swollen postbasally near suture, regularly and deeply seriate-punctate, the punctures mostly larger than interspaces, both longitudinally and transversely. *Ventral surfaces* sparsely or finely punctured. *Legs* long; fore and middle tarsus each with first segment as long as next two combined, fully as broad as third, and much larger than second; hind tarsus longer than its tibia, with first segment longer than following combined. Length 2.6 mm.; breadth 1.2 mm.

OVALAU: Holotype, male (BISHOP 2458), Andubandga, beating shrubs, at 500 m., Aug. 15, 1938, Zimmerman.

Differs from *C. evansi* Bryant in being entirely pale, in having the pronotum finely punctured, and the elytron heavily punctured and with the punctures extending to apex.

115. **Crepidodera evansi** Bryant

Crepidodera evansi Bryant, 1938, Roy. Ent. Soc. London, Proc. B 7(11): 251 (Taveuni; type in Brit. Mus.).

Elongate-oval, nitid, fulvous, with distal antennal segments, suture, and sides of elytron, fuscous. *Head* impunctate; *antenna* with second segment about one-half as long as first; third and fourth subequal, each longer than second; fifth slightly longer than fourth or sixth. *Prothorax* impunctate, feebly rounded at side, anterior angles oblique, transverse sulcus not very deep, terminated at each end by a short longitudinal sulcus. *Elytron* about twice as long as head and prothorax together, feebly punctate-striate, the apical portion impunctate, feebly carinate at side, widest behind middle and rounded at apex. *Hind tibia* with apical third finely toothed. Length 3 mm.

TAVEUNI: Quilai, 250 m.

116. **Crepidodera fijiensis** Csiki

Crepidodera nigra Bryant, 1925, Ann. and Mag. Nat. Hist. Ser. 9, 15: 597 (Labasa; Lautoka; type in Brit. Mus.).

Crepidodera fijiensis Csiki, 1939, Coleopt. Cat. 166: 298 (new name for *nigra* Bryant, *nec* Schilsky).

Entirely black except for basal antennal segments, which are testaceous, and apical segments, tibiae, and tarsi, which are fuscous. *Head* sulcate between eyes, smooth on vertex; *antenna* reaching a little beyond middle of elytron, first two segments rather swollen, third to sixth more slender, last five thicker; *prothorax* smooth, slightly transverse, with a strong basal sulcus which is terminated at each end by a short longitudinal sulcus; *elytron* twice as long as prothorax, with basal half strongly but irregularly punctured, forming irregular striae which behind middle become feeble and at the apex almost smooth. Length 2.25 mm.

VITI LEVU: Mt. Evans; Lautoka; Lami Quarry, near Suva, May 1951, Krauss; 25 specimens.

VANUA LEVU: Lambasa (type locality).

117. *Crepidodera kraussi* Gressitt, n. sp.

MALE: Reddish pitchy; antenna largely testaceous, pitchy on most of scape; pro-

notum metallic greenish black, bordered with pitchy; elytron metallic purplish.

Head carinate medially and grooved on each side between antennal insertions, the grooves continuous with grooves bordering eyes; occiput smooth and impunctate. *Antenna* slender, fully two-thirds as long as body; first two segments not very stout, scape half again as long as second; third to sixth slender, increasing slightly in length; last longest. *Prothorax* transverse, suboblong, slightly convex on lateral and basal margins; disc strongly convex, impunctate, deeply grooved subbasally. *Scutellum* rounded-triangular. *Elytron* long, somewhat gradually narrowed posteriorly, strongly swollen on disc behind base, unevenly punctured: punctures in rows, but postbasal swelling and posterior half of disc practically impunctate, and punctures strongest in depression behind postbasal swelling. *Ventral surfaces* finely and irregularly punctured. *Middle tarsus* with first segment nearly as long as next two combined, and narrower than third; hind tibia shallowly, and somewhat obliquely grooved posteriorly. Length 2.4 mm.; breadth 1.15 mm.

VITI LEVU: Holotype, male (BISHOP 2459), Lami Quarry, near Suva, May 1951, Krauss; allotopotype, female, and two male paratopotypes, same data.

Differs from *C. caeruleoviolacea* Bryant, of New Hebrides, in being smaller, in having the prothorax greenish, the elytron less bluish and much less even and less regularly punctured. Named in honour of N. L. H. Krauss, of Honolulu, the collector of a number of species described in this work.

118. ***Crepidodera rotunda*** Gressitt, n. sp.

FEMALE: Shiny black above, dark pitchy reddish beneath and on hind femur; antenna testaceous; legs reddish.

Head stout, smooth and shiny above. *Antenna* slightly over half as long as body, fairly slender; first two segments moderately thickened, scape a little longer than second; third about as long as second; fourth and fifth successively longer; sixth a little shorter than fifth and seventh; remainder subequal. *Prothorax* about three-fifths as long as broad, slightly convex in outline of each border; front corner oblique; disc subevenly convex, smooth, minutely punctulate, feebly grooved subbasally. *Scutellum* triangular, finely punctured. *Elytron* broad, even, without a postbasal swelling or depression; moderately, and regularly, punctured on basal three-fourths, the punctures smaller than interspaces, and with minute punctulation on general surface. *Abdomen* finely punctured. Fore and middle tarsus with first three segments subequal; hind tibia with posterior face flat or shallowly depressed for entire length, finely toothed on outer edge. Length 2.25 mm.; breadth 1.3 mm.

VITI LEVU: Holotype, female (BISHOP 2460), Lami Quarry, near Suva, May 1951, Krauss; paratopotype, female (elytra lacking), same data.

Differs from *C. fijiensis* Csiki (*nigra* Bryant), in being much broader, less than twice as long as broad, with the pronotum very shallowly grooved subbasally, and the elytron even, without a postbasal swelling followed by a depression.

Genus PSYLLIODES Latreille

Psylliodes Latreille, 1829, IN Cuvier, Regne Anim. 2 ed., 5: 154; Maulik, 1926, Fauna of India, Chrysom. and Haltic.: 124 (type: *Chrysomela chrysocephala* L.).

Head smooth or carinate medially; antenna 10-segmented; prothorax transverse, feebly rounded at side; elytron broader basally than prothorax, as a rule regularly punctate-striate; scutellar rows of punctures generally long; hind tibia broadened distally and channelled above, the channel bordered with spinules, with tarsal insertion considerably before apex; first hind tarsal segment long and slender; claws simple.

KEY TO FIJIAN SPECIES OF *Psylliodes*

1. Dorsum purplish black; antenna fulvous; elytron irregularly punctured; apical process of hind tibia tridentate . . . **simmondsi**

   Dorsum greenish; antenna pitchy with basal segments testaceous; elytron striate-punctate; apical process of hind tibia bidentate . . . . . **vitiensis**

119. **Psylliodes simmondsi** Bryant

Psylliodes simmondsi Bryant, 1938, Roy. Ent. Soc. London, Proc. B 7(11): 252 (Tamavua; type in Brit. Mus.).

Purplish black above; antenna, legs and venter fulvous. *Head* with basal half black, impunctate; *antenna* with five terminal segments tinged with fuscous; *prothorax* feebly and not closely punctured; *scutellum* impunctate; *elytron* rounded apically, irregularly punctured, the punctures stronger and closer than on pronotum; *hind femur* tinged with fuscous; apical process of hind tibia short and tridentate. Length 2.5 mm.

VITI LEVU: Tamavua (type locality).

120. **Psylliodes vitiensis** Bryant

Psylliodes vitiensis Bryant, 1925, Ann. and Mag. Nat. Hist. Ser. 9, 15: 597 (Cuvu, Lautoka; type in Brit. Mus.).

Greenish above; antenna pitchy with basal segments testaceous; venter piceous; legs testaceous. *Head* finely punctured; *antenna* with distal segments gradually increasing in length to apex; *prothorax* transverse, broadest at base, obtuse at anterior angle, evenly punctured, the punctures stronger than on head; *elytron* feebly striate, but strongly punctate, the punctures becoming feebler towards apex; *hind tibia* with apical process long, but shorter than first segment of hind tarsus, its apex bidentate; abdominal sternites finely punctured. Length 3 mm.

VITI LEVU: Thuvu; Lautoka.

Genus ALEMA Sharp

Alema Sharp, 1876, Ent. Monthly Mag. 13: 98 (type: *A. paradoxa* Sharp; New Zealand); Broun, 1880, Man. New Zealand Col. 1: 619.

KEY TO FIJIAN SPECIES OF *Alema*

1. Black, with second to sixth antennal segments fulvous; elytron strongly punctate-striate and costate . . . . . **leveri**

   Black, with antenna, clypeus, palpi and legs fulvous; elytron finely punctate-striate, with interstices slightly elevated . . . . . **nigra**

121. **Alema leveri** Bryant

Alema leveri Bryant, 1945, Ann. and Mag. Nat. Hist. Ser. 11, 12: 428 (Taveuni; type in Brit. Mus.).

Shiny black, second to sixth antennal segments fulvous. *Head* impunctate; eye prominent; *antenna* slender, reaching middle of elytron; scape equal to next two combined; second shorter than third. *Prothorax* subquadrate, sides feebly margined and contracted towards base; a transverse depression near base containing a few strong punctures; scutellum impunctate. *Elytron* tapering apically, strongly punctate-striate and costate. Length 2 mm.

TAVEUNI: Crater Lake (type locality).

122. **Alema nigra** Bryant

Alema nigra Bryant, 1938, Roy. Ent. Soc. London, Proc. B 7(11): 252 (Lautoka Mts.; type in Brit. Mus.).

Black, with antenna, clypeus, palpi and legs fulvous. *Head* with basal portion shiny and impunctate, interocular space elevated; *antenna* with pedicel rather shorter than scape, remainder elongate and slender, subequal. *Prothorax* subquadrate, feebly punctured, slightly depressed near base; scutellum impunctate. *Elytron* finely punctate-striate with

interstices slightly elevated, tapering sharply to apex; exposing extremity of pygidium. *Metasternum* impunctate; first abdominal sternite about as long as next three together, last feebly punctured. Length 2 mm.

VITI LEVU: Lautoka Mts. (type locality). One, Nandarivatu, 1100 m., Sept. 1938, Zimmerman, is questionably referred to this species.

Genus MANOBIA Jacoby

Manobia Jacoby, 1885, Mus. Civ. Genova, Ann. 22: 73 (type: *Manobia nigripennis* Jac.; Sumatra).

Ovate-subquadrate, convex; antenna nearly as long as body; terminal segments slightly thickened; prothorax with a depression near basal margin; scutellum broadly ovate; elytron deeply depressed behind the raised base, coarsely punctate-striate; hind tibia with small apical spine; first hind tarsal segment equal to next two united; claws appendiculate.

KEY TO FIJIAN SPECIES OF *Manobia*

1. Dorsum reddish brown to blackish; scape less than twice as long as second antennal segment **2**

   Dorsum dark metallic green; scape twice as long as second segment . . . . . **metallica**

2(1). Basal portion of pronotum distinctly and sinuately grooved, or feebly depressed and strongly punctured **3**

   Basal portion of pronotum with a distinct, smooth, and nearly impunctate, gradual depression . . . . . **levicollis**

3(2). Dorsum pitchy black; base of pronotum distinctly and sinuately grooved; second antennal segment distinctly larger than third . . . . . **producticollis**

   Dorsum reddish brown; base of pronotum feebly depressed; second antennal segment hardly larger than third . . . . . **obtusicollis**

123. **Manobia metallica** Bryant

Manobia metallica Bryant, 1945, Ann. and Mag. Nat. Hist. Ser. 11, 12: 427 (Tomaniivi; type in Brit. Mus.).

Dark metallic green; antenna and legs flavous. *Head* shiny, impuncate; *antenna* reaching middle of elytron, scape twice as long as second segment; *prothorax* shiny, finely punctured, more strongly so basally; *elytron* with interpunctural rows near side slightly costate. Length 2 mm.

VITI LEVU: Mt. Victoria (Tomaniivi): 900 m.; type locality.

124. ***Manobia levicollis*** Gressitt, n. sp.
Fig. 42

Dark reddish brown; tarsi testaceous; antenna pale brown with third to fifth segments testaceous and scape dark brown.

Head carinate medially on frons, finely grooved medially just behind antennal insertions; smooth and impunctate on occiput. *Antenna* more than one-half as long as body, distinctly thickened in last five segments; scape a little longer than second segment; third smaller, subequal to fourth; fifth longer, subequal to sixth; seventh and following each longer, and thicker, than sixth. *Prothorax* slightly broader than long, much longer in middle than at side, anterior and posterior angles oblique; basal margin sinuate, strongly convex at middle; disc smooth and shiny, very finely and sparsely punctured, gradually and broadly depressed near base. *Scutellum* rounded-truncate apically. *Elytron* swollen near base, depressed behind swelling, seriate-punctate, the punctures larger in depression and becoming quite fine in posterior quarter. *Abdomen* finely punctured. *Hind femur* small; hind tibia slender, feebly grooved behind; first hind tarsal segment shorter than remaining combined. Length 1.65 mm.; breadth 0.8 mm.

VITI LEVU: Holotype, male (BISHOP 2461), Nandarivatu, 1100 m., Sept. 10, 1938, Zimmerman.

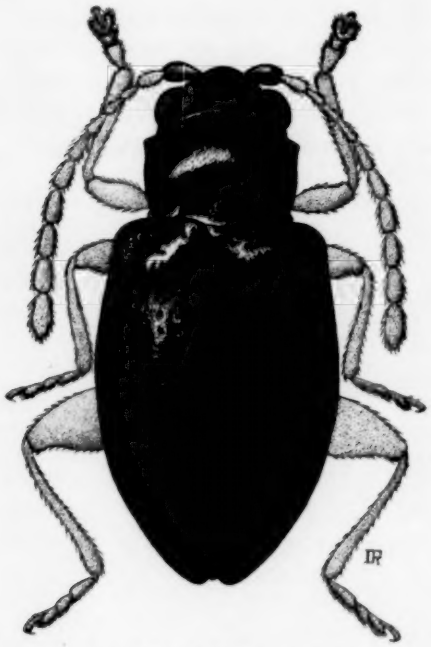

FIG. 42. *Manobia levicollis* Gressitt, n. sp., type.

Differs from *M. metallica* Bryant in being smaller, dark reddish instead of metallic green, with the scape much less than twice as long as second antennal segment, and the pronotum finely punctured basally.

125. ***Manobia obtusicollis*** Gressitt, n. sp.

Reddish brown, slightly pitchy on sides of metasternum and abdomen; antenna and legs pale ochraceous.

Head with frons fairly large, smooth; occiput impunctate. *Antenna* not quite reaching to middle of elytron; scape one-half again as long as second segment; third nearly as long as scape, subequal in length to following, which gradually increase in thickness; last longer. *Prothorax* three-fourths as long as broad, slightly broadened from base to apex, feebly convex at side, distinctly obtuse basally; disc subevenly convex, finely punctured, slightly depressed and somewhat more strongly punctured near base. *Scutellum* small, nearly hidden by pronotum. *Elytron* broadest anterior to middle, considerably attenuated apically; disc strongly swollen near base, depressed behind swelling, deeply punctured in fairly regular rows, the punctures stronger in postbasal depression and becoming very fine apically, the interspaces distinctly raised, particularly at side. *Ventral surfaces* slightly punctured. *Hind femur* not very stout; first hind tarsal segment nearly as long as remaining combined. Length 2.3 mm.; breadth 1.15 mm.

VITI LEVU: Holotype (BISHOP 2462), Nandarivatu, 1100 m., Sept. 6, 1938, Zimmerman. Two additional specimens, one of nearly same data as type, and the other from Tholo-i-suva, June 28, 1924, Bryan, are only tentatively associated with this species.

Differs from *M. costata* Bryant, in being reddish instead of partly greenish, in having the antenna paler, and the pronotum less strongly punctured.

126. ***Manobia producticollis*** Gressitt, n. sp.

MALE: Dark pitchy black above, more reddish pitchy beneath and on appendages; second to fourth antennal segments more reddish than remainder.

Head fairly long, produced at mouth parts, smooth on occiput. *Antenna* barely more than one-half as long as body; first two, and last five, segments thicker than others; scape a little longer than second segment; third smaller than second; fourth a little longer than third, subequal to fifth and following in length. *Prothorax* two-thirds as long as broad, broadened from base to apex, with side fairly straight; basal margin sinuate, strongly rounded and produced at middle; disc strongly convex, finely punctured, with a sinuate, more strongly punctured, subbasal depression. *Scutellum* small, subrounded behind. *Elytron* broadest anterior to middle; disc with a distinct postbasal swelling followed by a depression, distinctly punctured throughout in regular rows, the punctures slightly larger in postbasal depression and slightly finer near

apex. *Ventral surfaces* finely punctured. *Hind femur* moderately stout; first hind tarsal segment about as long as remaining combined. Length 1.7 mm.; breadth 0.95 mm.

VITI LEVU: Holotype, male (BISHOP 2463), Lami Quarry, near Suva, May 1951, Krauss; allotopotype, female, same data; 13 paratopotypes, same data; one paratype, Navai, Mar. 1951, Krauss.

Differs from *M. costata* Bryant, of New Hebrides, in being darker, with the elytra blackish and not greenish, and the pronotum more evenly punctured. This species may possibly belong to *Alema*.

Genus NESOHALTICA Maulik

Nesohaltica Maulik, 1929, Insects of Samoa 4(3): 201 (type: *N. nigra* Maulik; Samoa).

Rounded oblong; head with vertex delimited from interocular space by a deep transverse groove; raised areas in interocular space weakly developed; antenna 11-segmented, with two basal and five apical segments thickened; eye entire; prothorax transverse, rounded at side, each corner with a seta; elytron irregularly punctate; fore coxal cavity open, prosternal process broad, concave, rough; hind tibia with upper surface flat, with short spine near apex beneath tarsus; tarsus half as long as tibia, first segment shorter than rest combined; claws divaricate.

KEY TO FIJIAN SPECIES OF *Nesohaltica*

1. Pronotum distinctly punctured, smooth and not rugulose 2

   Pronotum uneven, shallowly rugulose, very finely and indistinctly punctured; antenna pale . . . . . **lauensis**

2. Shiny deep brown with a slight metallic tinge; pronotum finely and in part somewhat closely punctured; elytron irregularly punctured, more densely so than pronotum . . . . . **brunnea**

   Shiny black; pronotum finely and sparingly punctured; elytron strongly and somewhat closely punctured . . . . **vitiensis**

127. ***Nesohaltica brunnea*** Bryant, n. sp.
Fig. 43

Oblong; shining deep brown with a slight metallic tinge; antenna, legs, and underside paler; prothorax and elytron closely punctured.

Head deep brown, a transverse impression between the eyes, the basal half impunctate and shining; antenna fulvous, extending to the middle of elytron; first segment the longest and dilated at the apex; second much shorter and slightly rounded; remainder more elongate and each about equal, the five terminal slightly thickened. *Prothorax* deep brown with a metallic tinge, transverse, broadest at the base, the sides slightly contracted in front, the anterior angles oblique, closely and finely punctured. *Elytron* deep brown with a metallic tinge, slightly broader than the base of the prothorax, oblong, rounded at the apex, closely and irregularly punctured. *Legs* and underside paler and more fulvous, the posterior femora slightly darker. Length 2 mm.

VITI LEVU: Holotype (BISHOP 2464), Nandarivatu, 850 m., Sept. 8, 1938, beating shrubbery, Zimmerman. One of same data, questionably this species; four paratypes, Lami Quarry, near Suva, May 1951, Krauss, and a fifth specimen from Lami tentatively referred here.

FIG. 43. *Nesohaltica brunnea* Bryant, n. sp., type.

Allied to *N. vitiensis* Bry., and *N. atra* Bry. (New Hebrides), but differs in its color and punctation, in which *brunnea* is intermediate between these two.

128. ***Nesohaltica lauensis*** Gressitt, n. sp.
Fig. 44

Ochraceous brown, paler on fore and hind margins of pronotum; antenna testaceous; tibiae and tarsi pale ochraceous.

Head triangular and flat on frons, transversely grooved between upper eye lobes, convex and minutely punctured on occiput. *Antenna* one-half as long as body, first two segments about as stout as last few, third to sixth more slender; scape nearly twice as long as second; third to sixth each about as long as second. *Prothorax* two-thirds as long as broad, narrowed from base to apex, nearly straight at side with anterior angle slightly prominent; basal margin evenly convex; anterior border slightly convex; disc uneven, almost entirely roughened or shallowly rugulose, with minute, indistinct punctures. *Scutellum* triangular, smooth and concave. *Elytron* broadest behind middle, broadly rounded apically, irregularly, and rather closely punctured throughout, the punctures mostly as large as interspaces. *Ventral surfaces* in part distinctly punctured. First hind tarsal segment short. Length 1.6 mm.; breadth 0.95 mm.

LAU: Holotype (BISHOP 2465), Namuka-i-lau I., southern Lakemba I. (southcentral Lau Group), Aug. 12, 1924, E. H. Bryan, Jr.

Differs from *N. brunnea* and *vitiensis* Bryant in having the pronotum rough and somewhat rugulose, instead of smooth and distinctly punctured, and the coloration paler. Differs from *N. nigra* Maulik in the same characters, and in having the first two antennal segments much thicker than those immediately following.

129. **Nesohaltica vitiensis** Bryant

Nesohaltica vitiensis Bryant, 1938, Roy. Ent. Soc. London, Proc. B 7(11): 251 (Vanua Levu; Taveuni; type in Brit. Mus.).

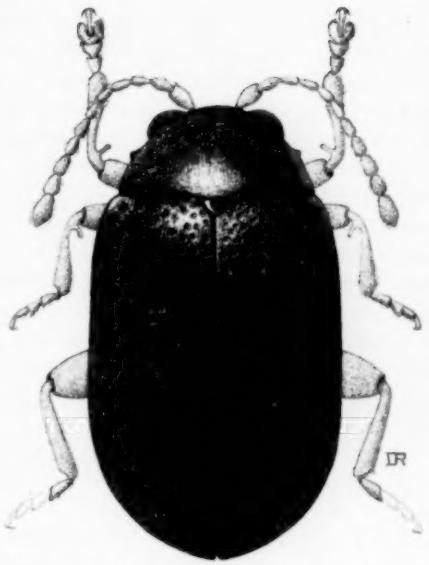

FIG. 44. *Nesohaltica lauensis* Gressitt, n. sp., type.

Shiny black; antenna fulvous with four apical segments fuscous; legs and underside pitchy brown. Head with basal half shiny black, impunctate; frons pitchy brown, a transverse impressed line between eyes; antenna reaching almost to middle of elytron; scape longer and more swollen than second, remainder more slender and subequal. Prothorax shiny black, finely and sparingly punctured, sides slightly rounded and margined, anterior angles obliquely truncate; scutellum shiny black, impunctate, triangular. Elytra shiny black, strongly and somewhat closely punctured, rounded at apex; side margin with a line of evenly spaced punctures which are much stronger than the other elytral punctures. Legs and underside pitchy brown. Length 2 mm.

VANUA LEVU: Lambasa (type locality).
TAVEUNI: Taken on guava.
HOST: *Psidium guajava* Linn.

Genus FEBRA Clark

Febra Clark, 1864, Jour. Ent. 2: 261 (type *F. venusta* Clark; Fiji).

Head vertical in front; vertex slightly grooved medially; eye large; antenna long, with scape long, thickened distally; prothorax transverse, rounded at side; elytron fairly broad, heavily punctured; hind tibia grooved above; first hind tarsal segment shorter than following combined, fairly stout.

KEY TO FIJIAN SPECIES OF *Febra*

1. Pronotum very coarsely punctured, hardly more than ten punctures in an approximate line medially from apex to base; elytron heavily punctured . . **2**

   Pronotum not very coarsely punctured, much more than ten punctures along median line; elytron generally sparsely punctured 3

2(1). Elytral punctures very close, only partly in regular rows; green above . . . . . **varioloidea**

   Elytral punctures not extremely close, in separate distinct rows; reddish above . . . . . **rubra**

3(1). Third antennal segment much longer than second; elytron not striped; length over 5 mm. 4

   Third antennal segment barely longer than second; elytron striped; length under 4 mm. 5

4(3). Pronotum distinctly punctured; elytron black, very finely punctured. . . . . **insularis**

   Pronotum not distinctly punctured; elytron reddish to partly or entirely metallic blue, subcoarsely punctured . . . . . **venusta**

5(3). Pronotum striped medially, minutely punctured; suture not distinctly black basally; elytron not almost entirely black in posterior half . **n. nigroornata**

   Pronotum not striped medially, impunctate; suture distinctly black basally; elytron almost entirely black in posterior half . **nigroornata vanuana**

130. **Febra venusta** Clark

Febra venusta Clark, 1864, Jour. Ent. 2: 262, pl. 12, fig. 5 (Fiji; type in Brit. Mus.).

Febra semiaurantiaca Fairmaire, 1882, Soc. Ent. de France, Ann. Ser. 6, 1: 490 (Ovalau); n. syn.

MALE: Ochraceous, slightly darker on antenna, posterior two-thirds of elytron and hind leg. *Head* and *pronotum* practically impunctate, latter with an irregular transverse row of spaced punctures in basal depression; scape shorter than third segment; *elytron* with punctures distinct but well spaced, in subregular rows. Length 5.5 mm.

FEMALE: Scape longer than third antennal segment; posterior two-thirds of elytron metallic bluish. Length 6 mm.

Maulik indicated the common identity of the above two names by his identification labels; *venusta* being the male and *semiaurantiaca* being the female.

VITI LEVU: Naivithula, Tailevu, Sept. 1937, Valentine, both sexes; Tholo-i-suva, Sept. 1950, Mar. 1951, Krauss.

OVALAU: Type locality of *semiaurantiaca*.

VANUA LEVU: Three, Nakawanga, Oct. 8, 1955, Gressitt. The males are colored similarly to those from Viti Levu, but the female has the elytron entirely purplish blue. Possibly a weak subspecies is involved.

HOST: *Nephrolepis* sp. (fern); the larva is a leaf-miner.

131. **Febra insularis** Bryant

Fig. 45*a*, *b*

Febra insularis Bryant, 1925, Ann. and Mag. Nat. Hist. Ser. 9, 15: 596 (Cuvu; type in Brit. Mus.).

Fulvous; elytra metallic bronze-green with fulvous margin. *Head* vertical and strongly produced in front; frons glabrous; occiput strongly punctured; *antennae* closed inserted; scape equal to third segment; second one-third as long; *prothorax* strongly and irregularly punctured; side with narrow margin with row of six deep punctures; hind margin

FIG. 45. *Febra insularis* Bryant: *a*, Larva, dorsal view; *b*, larval leaf mine in leaf of *Acrostichum* fern.

strongly emarginate; *elytron* four times as long as prothorax, finely punctate-striate, rounded to apex; *venter* glabrous; tibiae and tarsi briefly pubescent, tibial bases darkened. Length 6 mm.

EGG: White, spherical. Length 0.066 mm. Laid in a slit chewed in side of midrib of fern.

MATURE LARVA: Creamy white; head capsule reddish ochraceous, darker near anterior border and along median line, paler on basal antennal segment and along frontoclypeal suture; pronotum testaceous on central portion except along median line; a dirty broadish median dorsal stripe extending from mesonotum to last abdominal segment, appearing to consist of minute gray transverse sclerotizations on surface. Body about twice as wide as deep. Head flat, trapeziform, narrowed anteriorly, fairly smooth, finely vermiculose on central portion; two short bristles on lateral border behind ocellus-like pale node behind antenna; another bristle below this node. Pronotum rather even and flat, slightly wrinkled on sclerotized portion of disc. Dorsum of remainder of body finely granulose; ventral surfaces similar to dorsal, but median gray stripe lacking and a few well pigmented lines of sclerotization on prosternum and legs. Mesothorax and nine abdominal segments each bearing slightly pigmented spiracle at end of a white fleshy papilla-like mid-lateral projection on each side. Length 7.5 mm.

VITI LEVU: Thuvu (type locality). Between Nausori and Korovou, Sept. 1955, O'Connor, larvae and adults.

HOST: *Acrostichum aureum* (fern); the larva is a leaf-miner (see Fig. 45).

132. **Febra varioloidea** Fairmaire

Febra varioloidea Fairm., 1882, Soc. Ent. de France, Ann. Ser. 6, 1: 490 (Ovalau; type in Paris).

Reddish pitchy, tinged with metallic green on central portion of dorsum, appearing green to naked eye; pitchy to black on elytral declivities and ventral surfaces; appendages partly

reddish. Dorsum very deeply and coarsely punctured on metallic areas, more sparsely so on darker borders; elytral punctures in part tending to form sublongitudinal rows. Length 4 mm.

OVALAU: (type locality); Wainiloka, July 11, 1938, C. M. Cooke, Jr.

133. *Febra rubra* Gressitt, n. sp.
Fig. 46

FEMALE: Reddish ochraceous with a very slight purplish metallic tint on basal antennal segments, pronotum, and base, middle and lateral declivity of elytron.

Head concave in lateral outline anteriorly, with vertex projecting; swollen on each side and grooved medially between eyes, a lesser swelling on each side of occiput. *Antenna* slightly longer than body, slender; scape nearly as long as next two segments combined; third much longer than second; third and fourth subequal, following very slightly shorter. *Prothorax* nearly twice as broad as long, feebly convex on disc, but declivitous at side to margin, coarsely and closely punctured. *Scutellum* subtriangular, rounded behind. *Elytron* more than twice as long as head and prothorax together, coarsely punctured in 11 fairly regular rows, the punctures close longitudinally, but with distinct raised longitudinal interspaces. *Ventral surfaces* feebly punctured. First hind tarsal segment hardly as long as next two combined. Length 3.5 mm.

VITI LEVU: Holotype, female (BISHOP 2466), Nandarivatu, 1100 m., Sept. 10, 1938, Zimmerman. Two paratypes, Tholo-i-suva, Mar. and Apr. 1951, Krauss.

Differs from *F. varioloidea* Fairmaire in being reddish ochraceous instead of green above, in having the pronotum less deeply, though almost as coarsely, punctured, and the elytron punctured in distinct longitudinal rows with broad low ridges between the rows instead of densely punctured throughout. The paratypes are tinged with greenish above, and are partly green at sides of pronotum and elytron.

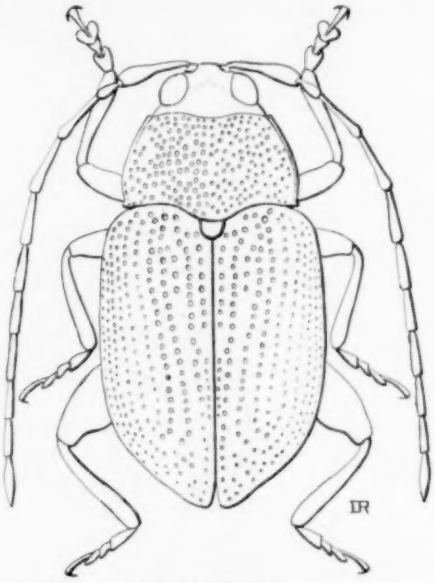

FIG. 46. *Febra rubra* Gressitt, n. sp., type.

134. *Febra nigroornata nigroornata* Bryant, n. sp.
Fig. 47

Oval, convex; flavous, side and median portion of prothorax black, elytron flavous, with a broad longitudinal black marking, broadening from base to apex, not touching side margin.

Head flavous, impunctate, a longitudinal median narrow impression from between antennal insertions to between eyes. *Antenna* long and slender, extending beyond middle of elytron, first segment very long, about equal to second and third together, third slightly longer than fourth, fifth to apical segments all about equal. *Prothorax* transverse, widest at base, contracted in front, impunctate, flavous, sides and base broadly black, and a longitudinal narrow black line, not touching anterior margin. *Scutellum* black, triangular, impunctate. *Elytron* with side rounded, widest just behind the middle, flavous, with the side broadly black, not touching side margin or suture, but broadening from base to apex, punctate-striate. *Legs* flavous; pos-

terior femora black. Underside flavous. Length 3 mm.

VITI LEVU: Holotype (BM, NH), Lautoka, Sept. 13, 1948, R. A. Lever; 2 paratypes, Nandarivatu, 1100 m., Sept. 10, 1938, Zimmerman. Eleven paratypes, Tholo-i-suva, Sept. 1950, Apr. 1951, and Lami Quarry, near Suva, Mar. 1951 and Jan. 1955, Krauss.

Allied to *Febra ovata* Bry., from New Hebrides, but smaller, with pattern different, more nitid, and not so strongly punctured.

135. ***Febra nigroornata vanuana***
Gressitt, n. subsp.

FEMALE: Testaceous, marked with areas of pitchy black: eye black; occiput black behind eye; pronotum black on outer half of disc, a little more broadly so at apex and base; elytron black except for a broad oblique hyaline strip from just behind middle of base to second quarter of suture, outer margin on basal two-fifths extending inward not quite to center, and external margin narrowly before apex, leaving extreme base, short sutural stripe, broad sinuous humeral stripe, and most of apical half, black; posterior half of hind tibia black.

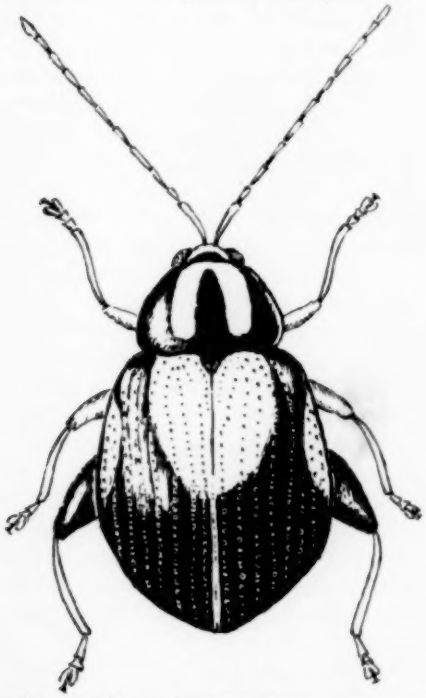

FIG. 47. *Febra n. nigroornata* Bryant, n. sp., type.

Head smooth, impunctate, subevenly convex between eyes. *Antenna* reaching middle of elytron; scape long and slightly arched, slightly longer than next two segments combined; third barely longer than second, but more slender; fourth longer than third; sixth and following shorter. *Prothorax* smooth and shiny, almost impunctate. *Elytron* distinctly punctured in regular rows, most of punctures on basal half slightly smaller than spaces between them, those on posterior half much smaller. Length 2.8 mm.

VANUA LEVU: Holotype, female (BISHOP 2467), near Nakawanga on trail from Nakawanga to Wailevu, 50 m., Oct. 9, 1955, Gressitt; and paratype, female, same data.

Differs from the typical form from Viti Levu in having the pronotum nearly impunctate, not striped medially, and pale on middle portion of basal margin, the elytron largely black in posterior half, with sutural stripe, more sinuous humeral stripe, and basal margin distinctly black.

Subfamily *HISPINAE*

Genus PROMECOTHECA Blanchard

Promecotheca Bl., 1853, Voyage Pôle Sud Zool. 4: 312 (type: *P. caeruleipennis* Bl.; Tonga).

Head short, about as broad as prothorax; antenna slender, two-thirds as long as body, the segments partly dissimilar in length; prothorax longer than broad, broadened in middle, constricted near base; elytron long, regularly striate-punctate; legs short and stout.

KEY TO FIJIAN SPECIES OF *Promecotheca*

1. Prothorax subparallel-sided in anterior third; pronotal disc more or less impunctate; legs entirely pale; antenna pale basally . . . . . **caeruleipennis**

Prothorax distinctly narrowed in anterior third; pronotal disc finely punctured; tibiae, tarsi, and hind femur blue; antenna bluish basally . . . . . **bicolor**

136. **Promecotheca caeruleipennis** Blanchard

Promecotheca caeruleipennis Bl., 1853, Voyage Pôle Sud Zool. 4: 312 (Tonga: Vavao).

Promecotheca Reichii Baly, 1869, Ent. Soc. London, Trans. 1869: 374 (Vavao); new syn.

Promecotheca reichei, Weise, 1911, Coleopt. Cat. 35: 54 (Tonga, Viti); Veitch and Greenwood, 1921, Linn. Soc. N. S. Wales, Proc. 46: 511; Maulik, 1929, Insects of Samoa 4(3): 210, figs. 17, 18 (Samoa); Taylor, 1937, The biological control of an insect of Fiji, Imp. Inst. Ent. pp. 1–239, figs. 1–17, maps 1–2, pls. 1–23; Greenwood, 1940, Linn. Soc. N. S. Wales, Proc. 65: 215; O'Connor, 1949, Agr. Jour. [Fiji] 20(2): 50 (Tonga).

Promecotheca lindingeri Aulmann, 1914, Ent. Rundschau. 31: 27 (Samoa).

Promecotheca caeruleipennis ab. *reichii*, Weise, 1922, Philippine Jour. Sci. 21: 70.

Testaceous; posterior two-thirds of elytron metallic blue-green; abdomen purplish; antenna pitchy distally. *Head* smooth; *prothorax* very slightly broadened in middle, constricted posteriorly, its disc fairly smooth, sometimes with vague and sparse minute punctures; *elytron* punctured in even, regular rows. Length 7–8 mm.; breadth 2–2.6 mm.

This species was stated by Taylor to occur on practically every island of Fiji, and to fluctuate in population, becoming a pest particularly in the Lau Islands. It has been very well controlled by the parasite *Pleurotropis parvulus*.

Fiji, Tonga, Samoa.

HOSTS: *Cocos nucifera* L.; *Pritchardia* (*Eupritchardia*) *pacifica* Seem; *Livistona* sp.

137. **Promecotheca bicolor** Maulik

Promecotheca bicolor Maulik, 1927, Ann. and Mag. Nat. Hist. Ser. 9, 20: 107, fig. 2 (Viti Levu; type in Brit. Mus.).

Reddish testaceous; antenna bluish; posterior two-thirds of elytron blue-green; abdomen blackish green; tibiae, tarsi, and hind femur greenish. *Head* smooth; antenna slender; *prothorax* distinctly broadened in middle, narrowed apically, strongly constricted near base, its disc finely punctured; *elytron* punctured in regular rows. Length 7–8.5 mm.; breadth 2.5–3 mm.

VITI LEVU: Near Suva (type locality). Lami, Mar. 1951, Tholo-i-suva, Jan. 1955, Krauss; two specimens.

VANUA LEVU: Wainunu, in *Flagellaria*, Sept. 1934, R. W. Paine (Dept. Agr. collect., Koronivia).

HOST: *Flagellaria* sp.

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An Annotated List of Marine Algae from Eniwetok Atoll, Marshall Islands[1]

E. YALE DAWSON[2]

THE FOLLOWING ACCOUNT is based largely upon collections made by the writer at Eniwetok during the late summer of 1955 and upon collections made on several occasions prior to that time by Dr. Ralph F. Palumbo of the Applied Fisheries Laboratory, University of Washington. The object of the work has been the preparation of a reference collection of algae of the atoll for deposition at the Eniwetok Marine Biological Laboratory (EMBL), where it may be consulted by future biological investigators interested in identifying algal research materials.

There exist only three previous accounts of Eniwetok marine algae, namely, Taylor's *Plants of Bikini . . .* (1950) which treats of 67 species, Palumbo's (1950) brief listing of a few entities, most identified only to genus, and Odum and Odum's (1955) mention of four species by name. The most comprehensive list of Marshall Islands algae to date has just been published by the writer (1956) in *Pacific Science*. It treats of 149 species (exclusive of Myxophyta) for the southern Marshall Islands. All but 43 of these are again listed in the present account, which includes 228 species and varieties. Of these, 36 are Myxophyta, 79 Chlorophyta, 20 Phaeophyta, and 91 Rhodophyta.

Inasmuch as this paper can be of greatest service as an aid to the identification of the algae occurring at Eniwetok, a key to all of the genera is included as well as an illustration for each species of Green, Brown, and Red Algae for which a figure is not to be found among the following accounts of tropical Pacific marine algae: Taylor, 1950; Dawson, 1954; Dawson, 1956. If these three papers are employed in conjunction with the present list, one should find it relatively easy to identify a great majority of the species encountered.

It should be noted that the key to the genera is intended to apply specifically to those algae recorded here from Eniwetok Atoll. It does not necessarily apply to species of those genera from other regions.

The short glossary of certain special phycological terms is intended to aid those of other disciplines in the use of the key.

ACKNOWLEDGMENTS

Nearly all of the algal collections cited here other than the writer's were made by Dr. Ralph F. Palumbo, who kindly contributed much time in preparing them for study in Honolulu. The list is considerably more comprehensive as the result of the availability of his specimens, which provide an excellent supplement to mine.

Dr. Francis Drouet provided identifications for all of the Blue-green Algae, so that this

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part of the list may be considered entirely his own contribution.

Dr. Harold St. John kindly prepared the Latin diagnoses of new taxa.

Special thanks are due to Dr. Robert W. Hiatt for making all the arrangements for carrying out this study, and to Dr. Maxwell S. Doty for the use of his library and other facilities in Honolulu. Several others contributed help in various ways, especially Mr. Malvern Gilmartin, Mr. A. Dexter Hinckley, Mr. Robert T. B. Iversen, Mr. James Stewart, Dr. Donald W. Strasburg, and Dr. A. J. Bernatowicz.

Photographs are by Mr. George Edelman.

COLLECTING LOCALITIES

Inasmuch as a number of variations occur in the spelling and application of the names of islands in Eniwetok Atoll, a list is presented here to show the equivalents. The list follows the succession of islands in a clockwise manner, beginning with Bogallua in the northwest part of the Atoll. The first name given in each case is that used in the text and in the labeling of specimens, followed by some common variations which may be encountered on United States maps and in geographical publications.

Bogallua
Bogombogo
Eneroul = Eybbiye = Ruchi (often treated as a single island with the next)
Runo = Eybbiye = Ruchi = Cochiti
Bokanjoio = Sanildefenso
Elugelab
Lidilibut = Teiteiripucchi
Bogairik = Bogeirik
Bokaniuar
Bogon
Engebi
Muzin = Mujinkarikku
Kirinian = Biilee
Bokonaarappu
Yeiri
Aitsu
Rujoru = Lujor = Pujiyoru = Rujiyoru
Eberiru
Aomon = Aranit
Biijiri = Biiziri
Rojoa
Aaraanbiru = Arambiru
Piiraai
Runit
Enedrol
Chinieero
Aniyaanii = Japtan
Chinimi
Japtan = Muti
Bogen = Boken = Jieroru
Parry
Eniwetok
Igurin
Mui = Buganegan
Pokon = Bogan
Ribaion = Libiron = Ribairon
Giriinien = Grinem
Rigili

The following is a complete list of the writer's collections made during August and September 1955. The inclusive field collection numbers precede the locality data in each case. It should be noted that where these numbers are cited in the text they are prefixed by "D." Collection numbers by Palumbo are prefixed by "P.," and, because of their smaller number and scattering in time and space, are provided with locality data in the text. Those collections by Taylor which represent species not again collected are cited by his field number prefixed by "T."

A specimen of each of the Dawson and Palumbo collections cited here is deposited in the Eniwetok Marine Biological Laboratory, with the exception of the type specimens of new species and varieties, which are deposited in the Bernice P. Bishop Museum in Honolulu.

13607–13654. Parry Island, outer seaward reef opposite EMBL, Aug. 19.

13655–13679. Parry Island, seaward reef flat between EMBL and south end of island, Aug. 20.

13680–13692. Parry Island, seaward reef flat at extreme south end of island, Aug. 21.
13693. Parry Island, drift in front of EMBL, Aug. 21.
13694–13712. Parry Island, among coral heads in the lagoon near south end of island in 6 to 10 feet of water, Aug. 21.
13713–13716. Aniyaanii Island, inshore lagoon near landing, Aug. 22.
13717–13745. Aniyaanii Island, seaward reef just on or inside of coralline ridge, Aug. 22.
13746–13781. Aniyaanii Island, under coral and rocks in tidal washes at north side of island, Aug. 22.
13782–13798. Aniyaanii Island, lagoon side among coral heads in 3 to 8 feet of water, Aug. 22.
13799–13824; 13855–13858a. Engebi Island, ocean side reef, Aug. 23.
13825–13827. Engebi Island, on a boulder in middle of ocean side reef, Aug. 23.
13828. Engebi Island, lagoon side drift, Aug. 23.
13829–13854. Engebi Island, algal mat area on dead coral and sand bottom of lagoon side, Aug. 23.
13859–13874. Igurin Island, seaward reef, Aug. 24.
13875–13877. Igurin Island, at depth of 20 feet off edge of seaward reef, Aug. 24.
13878. Igurin Island, sand flat on sea side, Aug. 24.
13879–13880. Igurin Island, seaward reef drift, Aug. 24.
13881–13885. Igurin Island, lagoon side drift near north end, Aug. 24.
13888–13897. Igurin Island, mid-island lagoon in 3 to 6 feet of water, Aug. 24.
13893–13899. Runit Island, lagoon side bottom at about 8-foot depth, Aug. 25.
13900–13908. Runit Island, scraped from a *Tridacna* shell from 20-foot depth in the lagoon, Aug. 25.
13909–13910. Runit Island, lagoon side drift, Aug. 25.
13911–13916. Runit Island, from vertical sides of pier piles in the lagoon, Aug. 25.
13917–13925. Runit Island, on a floating bumper log fastened to the pier, Aug. 25.
13926–13936; 13940–13946. Runit Island, ocean reef flat, Aug. 25.
13937–13939. Runit Island, in the lagoon in 10 feet of water, Aug. 25.
13947–13954. Parry Island, in the lagoon among coral heads in 10 to 12 feet of water, Aug. 28.
13955–13956. ¾ mile off Aniyaanii Island, on lagoon bottom in 90 feet (drift), Aug. 29.
13957–13961. Parry Island, lagoon beach in 6- to 8-foot depths, Aug. 29.
13962–13970. ½ mile off Aniyaanii Island, around and on a dead coral head in the lagoon at 35- to 65-foot depths, Aug. 30.
13971. Parry Island, off lagoon swimming beach in 10 feet of water, Aug. 30.
13972–13983. Parry Island, in end of pipe and beneath outfall of salt water from generating plant opposite EMBL, Aug. 30.
13984–13995. Japtan Island, reef along passage opposite Parry Island, Aug. 30.
13996–14000. 1½ miles off Aniyaanii Island, lagoon bottom at a depth of 135 feet, Aug. 31.
14001–14020. Rigili Island, seaward reef near edge at north end of island, Sept. 2.
14021–14032. Rigili Island, sand bottom in lagoon in 3 to 6 feet of water, Sept. 2.
14033–14039. Rigili Island, at small island on lagoon side subject to prevailing winds, Sept. 2.
14040–14041. Rigili Island, seaward reef, Sept. 2.
14042–14043. Parry Island, lagoon swimming area, Sept. 3.
14044–14053. Parry Island, on and around tanker wreckage adjacent to passage, Sept. 3.

GLOSSARY

chromatophore: a pigment-bearing structure within the cell.
corticated: provided with a complete or incomplete layer of superficial cells over the primary axis of the thallus.

distichous: disposed in two vertical rows; two ranked.
endophytic: growing within another plant.
epiphytic: growing on another plant.
heterocysts: cells which are uniformly dissimilar in shape and (or) size from their neighbors.
intercalary: inserted between, as opposed to terminal or basal.
medulla: the central or inner tissue of a thallus as opposed to the cortex.
midrib: a vein-like or rib-like thickened axis of a blade.
monosporangium: an asexual reproductive organ in the red algae which produces a single spore.
multifarious: disposed in many ranks about an axis.
multiseriate: of more than a single row of cells.
rhizoidal filaments: thick-walled, very long cells of exceedingly small diameter running vertically between the larger cortical cells as in *Gelidium*.
rhizoids: small root-hair-like unicellular or multicellular outgrowths for attachment.
saxicolous: growing on rocks.
stichidium: a club-shaped reproductive branch in the red algae producing tetrasporangia.
tetrasporangium: an asexual reproductive organ in the red algae which produces spores in groups of four.
trabeculae: bars or strands running from one side of a coenocytic thallus to the other, as in *Caulerpa*.
trichoblast: a branched, colorless, hair-like outgrowth produced around the apex of certain red algae, usually soon falling away.
trichome: the individual cellular filament of a multicellular blue-green alga, not including the sheath.
tristichous: disposed in three vertical rows; three ranked.
uniseriate: of a single row of cells.
utricles: the enlarged, bladder-like ends of the filaments of *Codium* which are arranged to make up the surface layer of the thallus.

KEY TO THE GENERA OF MARINE ALGAE OF ENIWETOK

1. Plants unicellular, or apparently so, macroscopic or microscopic, spheroidal, ellipsoidal or club-shaped 2
1. Plants multicellular, or, if noncellular the thalli macroscopic and not solid spheroidal, ellipsoidal or club-shaped . 8
2. Plants microscopic, less than 40 μ in diameter, in pairs or colonies within a gelatinous matrix or sheath, sometimes (in *Entophysalis*) arranged in short filaments 3
2. Plants macroscopic, bladder-like 7
3. Colonies showing no particular orientation into basal and apical regions 4
3. Colonies showing orientation of cells into basal and apical regions . . . . . **Entophysalis (deusta)**
4. Colonies without definite shape; cells symmetrically ellipsoidal 5
4. Colonies with a definite shape; cells pear-shaped . . . . . **Gomphosphaeria**
5. Cells spheroidal, or hemispheroidal when divided 6
5. Cells elongate ellipsoidal . . . . . **Coccochloris**
6. Cells usually single or paired, enclosed in a thick, gelatinous sheath . **Anacystis**
6. Cells forming colonies within a gelatinous matrix . . **Entophysalis (conferta)**
7. Thalli spheroidal, attached by small unbranched rhizoids cut off by a septum from the main cell . . . . . **Valonia (ventricosa)**
7. Thalli short club-shaped, attached by branched, nonseptate rhizoids . . . . . **Boergesenia**
8. Thalli multicellular or noncellular, branched if uniseriate 9
8. Thalli multicellular, but each filament consisting of only an unbranched row of cells (the false branching in *Plectonema* and *Scytonema* is the result of protrusion of a broken trichome through a rupture in the sheath) 99

9. Thalli not minute borers through calcareous material 10
9. Thalli boring through coral, shell and other calcareous material . . **Ostreobium**
10. Thalli calcified, either completely so as to become hard and stony, or incompletely so as to appear limy 11
10. Thalli not calcified 24
11. Thalli essentially prostrate, crustose; if erect branches present, these inflexible and stony 20
11. Thalli erect and flexible, not prostrate or crustose 12
12. Thalli not parasol-shaped 13
12. Thalli shaped like a small parasol . . . . . **Acetabularia**
13. Thallus parts of cylindrical shape . . . 14
13. Thallus parts flat or flattened 18
14. Thalli branched 15
14. Thalli unbranched (as viewed macroscopically) . . . . . **Neomeris**
15. Thalli distinctly jointed 17
15. Thalli not distinctly jointed 16
16. Thalli soft and lubricous . . . . . **Liagora**
16. Thalli firm, not lubricous . . . **Galaxaura**
17. Thalli large and coarse, the segments 2 to several mm. in diameter . . . . . **Halimeda (monile** forms)
17. Thalli small and delicate, the segments less than ½ mm. in diameter . . . . **Jania**
18. Thalli not jointed, fan-shaped 19
18. Thalli jointed . . . . . **Halimeda (except monile** forms)
19. Thalli brownish, with prominent concentric banding . . . . . **Padina**
19. Thalli greenish, not prominently banded concentrically . . . . . **Udotea**
20. Thalli forming thin, adherent crusts . 21
20. Thalli forming massive, stony crusts, sometimes with erect knobs or branches . . . . . **Porolithon**
21. Thalli epiphytic, very delicate 22
21. Thalli saxicolous, coarser 23
22. Thalli in surface view with frequent larger cells (heterocysts) among the otherwise uniform cells . . . . . **Fosliella**
22. Thalli in surface view composed of uniform cells . . . . . **Heteroderma**
23. Underside of thallus of many fan-shaped groups of cells converging and diverging irregularly . . . . . **Cruoriella**
23. Underside of thallus of essentially parallel cell rows . . . . . **Peyssonelia**
24. Thalli filamentous, membranous, or massive, but in any case divided up into cells by cross walls 31
24. Thallus parts not divided up in a cellular manner by cross walls 25
25. Filaments composing thalli dichotomously branched 26
25. Thalli, or filaments composing thalli, not dichtomously branched 29
26. Filaments growing together to form a flabellate or peltate, spongy plant body 27
26. Filaments free, not forming a spongy plant body 28
27. Main forked filaments bearing numerous terminally pronged lateral branchlets . . . . . **Rhipilia**
27. Main forked filaments without such terminally pronged lateral branchlets . . . . . **Avrainvillea**
28. Filaments over 100 μ in diameter above, tending to be larger above than below, not attenuated . . **Pseudochlorodesmis**
28. Filaments usually under 50 μ in diameter above, attenuated or at least of lesser diameter above than below . . **Derbesia**
29. Thallus parts spongy, composed of interlaced filaments forming a surface layer of swollen utricles . . . . . **Codium**
29. Thallus parts not spongy, without a surface layer of swollen utricles 30
30. Thalli consisting of basal, cylindrical rhizoid-bearing parts and erect, specialized branches of distinctive shapes; interior of thallus criss-crossed by trabeculae . . . . . **Caulerpa**
30. Thalli consisting of erect axes bearing pinnate or multifarious branches; interior without trabeculae . . . **Bryopsis**

31. Thallus essentially of a single branched row of cells 32
31. Thallus filamentous, membranous or massive, consisting of more than a single, branched row of cells 51
32. Filaments prostrate, spreading; plants microscopic, epiphytic or endophytic . . . . . **Entocladia**
32. Not as above; filaments free and more or less erect 33
33. Individual cells mostly essentially cylindrical and symmetrical except for curvature 35
33. Individual cells asymmetrical, mostly not cylindrical 34
34. Cells protruding irregularly on all sides from the axes . . . . . **Siphonocladus**
34. Cells inflated, irregularly clavate to subovate, in short, more or less repent series of only a few cells . . . . . **Valonia** (in part)
35. Thallus filaments branched in one plane in a fan-, or blade-like manner, at least in part 36
35. Thallus filaments variously branched, but not forming fan- or blade-like parts 38
36. Filaments palmately branched . . . . . **Rhipidiphyllon**
36. Filaments not palmately branched; blades of net-like form 37
37. Blades stalked . . . . . **Struvea**
37. Blades without a definite stalk . . . . . **Microdictyon**
38. Branches essentially free, not attached to each other 39
38. Branches attached to each other by small, specialized cells . . . . . **Boodlea**
39. Branching opposite or whorled, at least on main or lower axes 40
39. Branching alternate or irregular, multifarious 41
40. Axes with whorled branchlets; tetrasporangia surrounded by curved filaments . . . . . **Wrangelia (argus)**
40. Main axes (sometimes prostrate) with opposite and distichous or tristichous branchlets; tetrasporangia not associated with curved filaments . . . . . **Antithamnion**
41. Cell wall about as thick as cell cavity, at least in lower parts 42
41. Cell cavity much greater in diameter than cell wall thickness 43
42. Cell cavities oval, longer than broad . . . . . **Asterocytis**
42. Cell cavities more or less quadrangular, broader than long . . . . . **Goniotrichum**
43. Thalli brownish or reddish, bearing specialized external reproductive structures 46
43. Thalli greenish, without specialized external reproductive structures 44
44. Filaments bearing septa at base of branches 45
44. Filaments mostly, or commonly, without septa at base of branches . . . . . **Cladophoropsis**
45. Filaments coarse, 1–2 mm. in diameter . . . . . **Valonia (fastigiata)**
45. Filaments 0.3–1.0 mm. in diameter . . . . . **Valoniopsis**
45. Filaments delicate, less than 200 μ in diameter . . . . . **Cladophora**
46. Thalli brownish, commonly reproducing by means of multicellular gametangia . . . . . **Ectocarpus**
46. Thalli reddish, commonly reproducing by means of tetrasporangia or monosporangia 47
47. Minute epiphytes with main axes less than 15 μ in diameter 48
47. Epiphytic or saxicolous, but main axes over 70 μ in diameter 49
48. Chromatophores stellate . . . . . **Kylinia**
48. Chromatophores not stellate . . . . . **Acrochaetium**
49. Asexual reproduction by tetrasporangia 50
49. Asexual reproduction by monosporangia . . . . . **Neomonospora**

50. Branching regularly alternate and generally spirally arranged; axes less than 100 μ in diameter . . . . . **Callithamnion**
50. Branching irregular; axes over 100 μ in diameter . . . . . **Griffithsia**
51. Thalli consisting of a subcylindrical axis bearing coarse, angular, toothed lateral branches . . . . . **Turbinaria**
51. Thalli not as above 52
52. Thallus net-like, at least in part 53
52. Thallus not net-like 55
53. Thallus reddish, delicate, flat or four-sided 54
53. Thallus brown, coarse, convoluted . . . . . **Hydroclathrus**
54. Net-like parts formed as part of flabellate blades . . . . . **Hemitrema**
54. Entire thallus a four-sided net-like form around a central axis . . . . . **Dictyurus**
55. Thallus cushion-shaped or subspherical, solid or hollow, with cells of macroscopic size . . . . . **Dictyosphaeria**
55. Thallus not as above; cells not of macroscopic size 56
56. Thallus hollow-tubular or with hollow, vesicular or tubular parts 57
56. Thallus without hollow parts 62
57. Thallus without regular constrictions or cavity partitions 58
57. Thallus regularly constricted and with partitions across the cavity at the constrictions . . . . . **Champia**
58. Thalli hollow essentially throughout 59
58. Thalli consisting of a short, solid stipe bearing one or more hollow vesicles . . . . . **Botryocladia**
59. Thallus parts long and slender compared to diameter 60
59. Thallus parts short and inflated compared to diameter . . . . . **Rosenvingea**
60. Thalli reddish; the tube wall composed of several cell layers 61
60. Thalli greenish; the tube wall composed of a single layer of cells . . . . . **Enteromorpha**
61. Tetrasporangia borne in swollen, terminal stichidia . . . . . **Coelothrix**
61. Tetrasporangia borne in sunken cavities in the branches . . . . . **Lomentaria**
62. Thalli flat or markedly flattened, at least in part 63
62. Thalli essentially cylindrical (sometimes moderately compressed as in *Hypnea*) 75
63. Thalli brownish or reddish, not green, of more than one layer of cells, at least at the midrib if present 64
63. Thalli green, of a single layer of cells throughout . . . . . **Anadyomene**
64. Thallus with a midrib (note that the flattened blade part is very narrow in *Taenioma*) 65
64. Thallus without a midrib 67
65. Color reddish; branching not at all dichotomous 66
65. Color brownish; branching subdichotomous . . . . . **Dictyopteris**
66. Apices with two or three terminal hairs . . . . . **Taenioma**
66. Apices with a naked apical cell . . . . . **Hypoglossum**
67. Thallus surface covered with tufts of soft but mostly erect filaments . . . . . **Dasyopsis**
67. Thallus surface without tufts of filaments 68
68. Thalli prostrate and fastened by the lower surface 69
68. Thalli essentially erect, free, not prostrate 71
69. Thalli brown 70
69. Thalli red . . . . . **Rhodymenia**
70. Thalli fan-shaped . . . . . **Pocockiella**
70. Thalli dichotomously branched . . . . . **Dictyota (patens)**
71. Growing points not in apical pits . . . 72
71. Growing points in apical pits . . . . . **Laurencia (parvipapillata)**
72. Growing point consisting of a single apical cell 73

72. Growing point without a distinguishable apical cell . . . . . **Grateloupia**
73. Thalli small, narrow, less than 1 cm. tall; medulla of several layers of small cells 74
73. Thalli moderately large, 3–10 cm. tall; medulla of a single layer of large cells . . . . . **Dictyota** (in part)
74. Medulla with rhizoidal filaments running through it . . . . . **Gelidium**
74. Medulla without rhizoidal filaments running through it . . . . . **Gelidiella (bornetii)**
75. Axes and branches all similar in appearance and structure 80
75. Axes distinct from ultimate branchlets in appearance and structure 76
76. Branchlets produced in whorls . . . . . **Wrangelia** (in part)
76. Branchlets produced alternately or irregularly 77
77. Branchlets not banded 78
77. Branchlets banded . . . . . **Spyridia**
78. Branchlets multiseriate; plants rather large, 6–12 cm. tall . . . . . **Asparagopsis**
78. Branchlets uniseriate; plants small, usually less than 2 cm. tall 79
79. Main axes completely or incompletely corticated . . . . . **Dasya**
79. Main axes uncorticated . . . . . **Heterosiphonia**
80. Thallus parts of essentially uniform cell structure throughout; not banded although sometimes appearing segmented 81
80. Thallus parts provided with discontinuous cortication in the form of bands around a large axial cell row, the bands usually close together above and well separated below . . . . . **Ceramium**
81. Thalli of various reddish and brownish colors, but not grass green 82
81. Thalli grass green in color, entangled . . . . . **Enteromorpha (ralfsii)**
82. Branches provided with whorls of short, tooth-like spines, at least in part . . . . . **Centroceras** (in part)
82. Branches without whorls of spines . . 83
83. Middle and upper thallus parts showing only a few cells (2–5) across the diameter when seen in surface view 84
83. All thallus parts showing many (10 or more) small cells across the diameter when seen in surface view 89
84. Branches termination in a large apical cell of nearly the same diameter as the filament bearing it . . . . . **Sphacelaria**
84. Branches terminating in an apical cell which is much smaller than the diameter of the filament bearing it 85
85. Thalli with definite axes provided with dense, multifarious, divaricately branched short branchlets which in mature plants become attached to each other . . . . . **Tolypiocladia**
85. Branching not as above 86
86. All branches essentially of unlimited growth 87
86. Branches of potentially unlimited growth alternating with groups of branches of definitely limited growth . . . . . **Herposiphonia**
87. Erect filaments arising from extensive prostrate creeping filaments . . . . . **Lophosiphonia**
87. Without extensive prostrate filaments 88
88. Mature filaments composed of cells in tiers of three . . . . . **Falkenbergia**
88. Mature filaments composed of cells in tiers of four or more . . . . **Polysiphonia**
89. Surface cells not arranged in regular rows, nor the thallus appearing segmented 90
89. Surface cells arranged in horizontal and vertical rows and the thallus appearing somewhat segmented . . . . . **Centroceras (apiculatum)**
90. Thallus without a central core of small cells in the medulla 91
90. Thallus in cross section showing a core of very small cells in the center of the medulla . . . . . **Dicranema**

91. Medullary cells all similar and more or less isodiametrical in cross section . . **92**
91. Thallus in cross section showing minute rhizoidal filaments between the medullary cells . . . **Gelidium (crinale)**
92. Growing points consisting of an apical cell, either emergent or in an apical pit **95**
92. Apices without a single apical cell . . . **93**
93. Branching irregular, but not markedly divaricate; thalli very slender and wiry **94**
93. Branching markedly divaricate; thalli moderately coarse and succulent . . . . . **Chnoospora**
94. Tetrasporangia and antheridia borne in swollen, terminal stichidia; thalli forming small tufts and clumps; main branches mostly 175–250 μ in diameter . . . . . **Gelidiopsis**
94. Reproduction not to be expected; thalli forming wiry mats; main branches (100) 140–230 μ in diameter . . **Wurdemannia**
95. Apical cell in a terminal pit **96**
95. Apical cell emergent **97**
96. Thalli erect or with creeping and erect branches, with many very short ultimate branchlets . . . . . **Laurencia** (in part)
96. Thalli creeping, with few very short ultimate branchlets . . . . . **Chondria (repens)**
97. Thalli minute, mostly under 2 mm. high **98**
97. Thalli larger, 1–3 cm. high . . . **Hypnea**
98. Growing points without trichoblasts . . . . . **Gelidiella (tenuissima)**
98. Growing points provided with short trichoblasts . . . . . **Chondria** (in part)
99. Individual filaments (trichomes) tapering from base to apex **100**
99. Individual filaments not tapered, of approximately equal diameter throughout **101**
100. With intercalary heterocysts . **Calothrix**
100. With basal heterocysts . . . . . **Rivularia**
101. Filaments epiphytic, erect, attached by a single, modified basal cell . . . . . **Erythrotrichia**
101. Filaments epiphytic or saxicolous, but entangled and without any evident specialized basal attachment cell on individual filaments **102**
102. Filaments with false branching by protrusion of trichomes through breaks in the sheath; heterocysts present or absent **103**
102. Individual filaments without false branching **104**
103. Heterocysts present . . . . . **Scytonema**
103. Heterocysts not present . . **Plectonema**
104. Heterocysts present . **Hormothamnion**
104. Heterocysts not present **105**
105. Without a sheath around the uniseriate filament **106**
105. Uniseriate filaments surrounded by a sheath **109**
106. Filaments straight or curved, but not spirally coiled **107**
106. Filaments spirally coiled . . . . **Spirulina**
107. Cells very short, less than half as long as broad . . . . . **Oscillatoria**
107. Cells not very short, generally longer than broad; filaments generally over 20 μ in diameter **108**
108. Filaments 20–30 μ in diameter . . . . . **Rhizoclonium**
108. Filaments 60–90 μ in diameter . . . . . **Chaetomorpha**
109. Cells very short, less than half as long as broad **110**
109. Cell length about equal to or greater than breadth **111**
110. Sheaths distinct, firm; trichomes single within the sheath . . . . . **Lyngbya**
110. Sheaths more or less mucous, diffluent; trichomes several within the sheath . . . . . **Hydrocoleum**
111. Trichomes single within the sheath **112**
111. Trichomes many within the sheath, at least in older parts **115**
112. Trichomes 3 μ or less in diameter . . **113**

112. Trichomes 5 μ or more in diameter. **114**
113. Plant body a light colored, cushion-shaped form . . . . . **Phormidium (crosbyanum)**
113. Plant body a dark colored stratum . . . . . **Symploca (laete-viridis)**
114. Plant body an erect, spongy, brush-like tuft . . . . . **Symploca (muscorum)**
114. Plant body a loose, soft group of short, gelatinous strings . . . . . **Phormidium (penicillatum)**
115. Apical cell blunt-conical . . **Schizothrix**
115. Apical cell acutely conical . . . . . **Microcoleus**

SYSTEMATIC LIST

GREEN ALGAE

Enteromorpha acanthophora Kützing?
D. 13920a. A few small bits of uncertain identity.

Enteromorpha clathrata (Roth) J. Agardh; Dawson 1954: 384, fig. 6d, e; Dawson 1956: 27
D. 13961.

Enteromorpha intestinalis (Linnaeus) Link; Dawson 1954: 383, fig. 6c
D. 13917.

Enteromorpha kylinii Bliding; Dawson 1954: 384, fig. 5; Dawson 1956: 27
D. 13826. P. 2846, Bokanjoio Is. boat passage at 6 ft., 9/30/54.

Enteromorpha ralfsii Harvey; Dawson 1956: 27, fig. 2
D. 13792, 14024. P. 1187, Bokanjoio Is. tide flats, 4/14/54; P. 2849, Bokanjoio Is. seaward tide flats, 9/29/54; P. 18150, Runo Is. tide flat pool, 2/10/55.

Enteromorpha tubulosa (Kützing) Kützing; Dawson 1954: 384, fig. 6a, b
D. 13920.

Valonia aegagropila C. Agardh; Dawson 1954: 388, fig. 8j; Dawson 1956: 28; Taylor 1950:41
D. 13610, 13736, 13930, 14039.

Valonia fastigiata Harvey ex J. Agardh 1887: 101 (Ceylon)
Fig. 1

P. 29x, Mui Is. seaward tide flats under rocks in large clumps, 3/11/54.
This compares well with the species as understood by Egerod (1952) and with Kanda's fig. 9A (1944) of a plant from Koror.

Valonia utricularis (Roth) C. Agardh; Dawson 1956: 28, fig. 3
P. 7, Rigili Is. under rocks, 8/10/49; P. 2836c, Parry Is. seaward reef edge, 4/4/54.

Valonia ventricosa J. Agardh; Dawson 1954: 388, fig. 8e; Dawson 1956: 28
D. 13751, 13927, 14002.

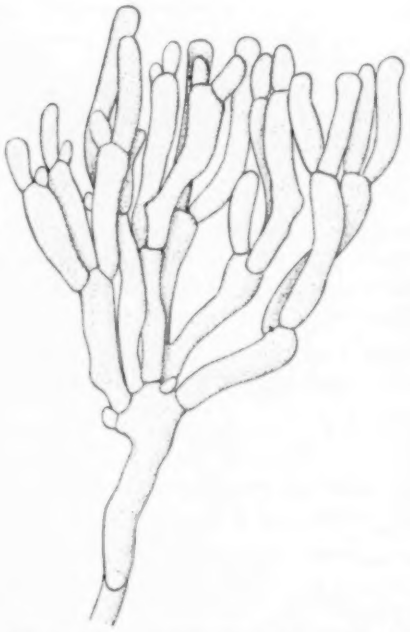


FIG. 1. *Valonia fastigiata*: Habit of part of a plant of P. 29x, × 2.5.

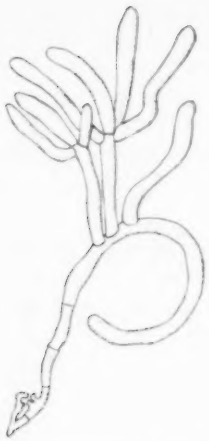


FIG. 2. *Valoniopsis pachynema*: Part of a plant to show branching and septation, × 5 (after Børgesen).

Valoniopsis pachynema (Martens) Børgesen 1934: 10, figs. 1, 2; Taylor 1950: 42. *Bryopsis pachynema* Martens 1866: 24, pl. 4, fig. 2 (Sumatra)

Fig. 2

T. 46–379. Not collected again.

Boergesenia forbesii (Harvey) Feldmann; Dawson 1954: 388, fig. 8d; Taylor 1950: 41 (as *Valonia forbesii* Harv.)
D. 13732.

Dictyosphaeria cavernosa (Forskål) Børgesen; Taylor 1950: 43, pl. 27, fig. 2; Dawson 1954: 388, fig. 8i; Dawson 1956: 29
D. 13758, 14009.

Dictyosphaeria intermedia var. *intermedia* Weber van Bosse 1905: 14; Taylor 1950: 42; Dawson 1956: 29

Fig. 3

D. 13719. P. 2825, Runo Is. seaward reef edge, 3/8/55.

Dictyosphaeria versluysii Weber van Bosse; Dawson 1954: 388, fig. 8k, l; Dawson 1956: 29
D. 13753, 13675. P. 2821, Bokanjoio Is. seaward reef edge, 3/8/55.

Cladophoropsis gracillima Dawson, prox.; Dawson 1956: 30, fig. 7a, b
D. 14049. The material approaches this species closely but does not agree as fully as the specimens reported from Arno Atoll. The filaments are about 40 μ in diameter and have cells 25–50 diameters long.

Cladophoropsis sundanensis Reinbold; Dawson 1956: 30, fig. 8; Dawson, Aleem, and Halstead 1955: 10
D. 13909.

Siphonocladus rigidus Howe; Dawson 1956: 31, fig. 9
D. 13742a, growing in a mat of *Cladophora*.

Boodlea composita (Harvey) Brand; Taylor 1950: 44; Dawson 1954: 390, fig. 9c, d; Dawson 1956: 30
D. 13764, 13777, 13810, 13854, 13873, 13944, 14031. P. 2840, Eneroul Is. seaward tide flats, 9/23/54.

Boodlea siamensis Reinbold 1901: 107 (Thailand); Taylor 1950: 44
T. 46–400. Not collected again.

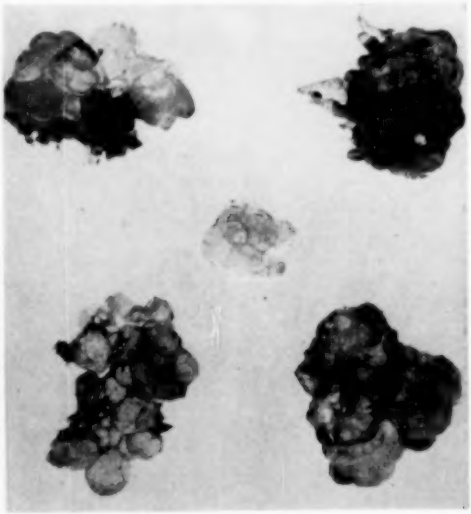


FIG. 3. *Dictyosphaeria intermedia*: Several fresh specimens of D. 13719, × 1.6.

Struvea anastomosans (Harvey) Piccone; Dawson 1954: 390, fig. 8g; Dawson 1956: 30
D. 13650, 13669, 13863, 13989, 14010.

Rhipidiphyllon reticulatum Askenasy; Dawson 1956: 32, fig. 10; Taylor 1950: 45
D. 13778, 14035a.

Microdictyon okamurai Setchell; Taylor 1950: 46, pl. 27, fig. 1; Dawson 1956: 32, fig. 11a
D. 13762, 13945. P. 54–18, Aitsu Is. seaward reef rim, 3/10/54; P. 2844, Bogombogo Is. seaward tide flats, 10/5/54.

Microdictyon japonicum is reported by Palumbo (1950) from Eniwetok without locality, based upon a determination by Lois Eubank Egerod.

Anadyomene wrightii Gray; Dawson 1954: 390, fig. 9e; Dawson 1956: 31
D. 13740.

Chaetomorpha indica Kützing; Dawson 1954: 386, fig. 6f, g; Dawson 1956: 33
D. 13982. P. 2842, Eneroul Is. seaward flats, 9/23/54; P. 2848, Bokanjoio Is. seaward flats, 9/29/54. These are apparently of the same entangled, free form found at Majuro Atoll without holdfast cells.

Rhizoclonium implexum (Dillwyn) Kützing 1845: 206; Smith 1944: 62, pl. 8, fig. 3. *Conferva implexa* Dillwyn 1809: 46, pl. B (England)
Fig. 4*a*

D. 13835, 14049a. This species is treated by Hamel under his genus *Lola*.

Cladophora crystallina (Roth) Kützing; Dawson 1956: 33, fig. 13b, c
D. 13923. The branches in this material range from 85 to 30 μ or less in diameter.

Cladophora inserta Dickie, variations; Dawson 1954: 388, fig. 7d (as *C. inserta* var. *ungulata*)

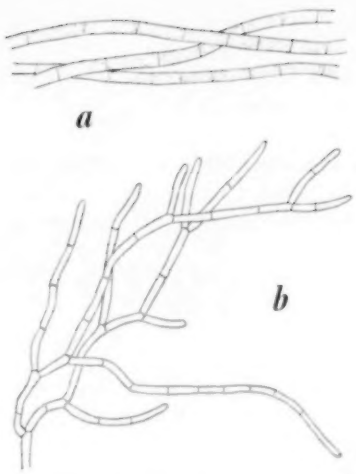


FIG. 4. *a*, *Rhizoclonium implexum*: Parts of filaments, × 80. *b*, *Cladophora socialis*: Part of a plant of D. 13742 near the typical form of the species, × 17.

D. 13837, 13857, 13903b. P. 2813, Bokanjoio Is. lagoon on stake in 3–8 ft., 3/8/55. Some of these specimens apparently correspond with var. *ungulata* (Brand) Setchell.

Cladophora socialis Kützing; Dawson 1956: 34; Dawson 1954: 388, fig. 7e (as *C. patentiramea* var. *longiarticulata* Reinbold)
Fig. 4*b*

D. 13699, 13742, 13806. These specimens seem to represent the same species collected by the writer in Viêt Nam and at Jaluit Atoll in the Marshall Islands. D. 13699 agrees especially well with Børgesen's Mauritius plant called *C. patentiramea* in 1940.

Cladophora luteola Harvey is reported by Palumbo (1950) from Eniwetok based upon a determination by F. Drouet, but a specimen so named by him from Bikini Atoll seems to be *Boodlea*.

Entocladia viridis Reinke; Dawson 1954: 388, fig. 7i
D. 13835a, in the cell wall of *Rhizoclonium*.

Derbesia attenuata Dawson 1954: 390, fig. 9a, b; Dawson 1956: 34
D. 13999b, epiphytic on *Halimeda;* D. 13767a, on small algae.

Derbesia marina (Lyngbye) Solier; Dawson 1956: 34, fig. 15a, b
D. 14006a, epiphytic on *Caulerpa.*

Derbesia ryukiuensis Yamada and Tanaka; Dawson 1956: 34, fig. 14b
D. 13710, 13791.

Bryopsis indica A. and Ethel Gepp; Dawson 1956: 34, fig. 14a; Taylor 1950: 50
D. 13730.

Bryopsis hypnoides Lamouroux 1809: 135, pl. 5, fig. 2 (Mediterranean Sea); Hamel 1931: 394, fig. 20 B; Smith 1944: 73, pl. 9, fig. 2

Fig. 5*a*, *b*

D. 13977.

Bryopsis pennata Lamouroux; Taylor 1950: 51; Dawson 1954: 393, fig. 11b; Dawson 1956: 34
D. 13703, 13797, 13859, 13907. P. 2855, Bogallua Is. lagoon pavement, 11/17/54. Considerable variation in branching occurs between examples corresponding to the type of the species and those better referred to the following variety.

Bryopsis pennata var. *secunda* (Harvey) Collins and Hervey 1917: 62; Taylor 1950: 52. *Bryopsis plumosa* var. *secunda* Harvey 1858: 31, pl. 45A, figs. 1–3 (Key West, Florida)
P. 52–31, Aomon Is. seaward reef, 10/22/52; P. 52–110, Engebi Is. lagoon, 11/8/52; P. 2585, Aitsu Is. 2/11/55; P. 2851, Bogombogo Is. seaward flats, 10/5/54; P. 2857, Aitsu Is. lagoon, 11/17/54.

Caulerpa acuta (Yamada) Yamada 1944: 34. *Caulerpa filicoides* Yamada 1936: 135, pl. 30, fig. 2. *Caulerpa verticillata* f. *acuta* Yamada 1934: 63, fig. 32 (Naha, Ryukyu Archipelago)

Figs. 6, 7

D. 13875, 13971, 14050.

Caulerpa antoensis Yamada; Dawson 1956: 36, fig. 20; Taylor 1950: 55, pl. 28, fig. 2 (as *C. arenicola* Taylor)
D. 13832.

Caulerpa bikiniensis Taylor 1950: 66, pl. 33 (Bikini Atoll, Marshall Is.)
D. 13774. The material is rather small and incompletely developed, but is apparently identical with Taylor's Bikini and Rogelap specimens. The problem of its relationship and possible varietal status in the *Caulerpa racemosa* complex cannot be taken up here.

Caulerpa brachypus Harvey 1859: 332 (Japan); Taylor 1950: 56, pl. 29, fig. 2
T. 46–422. Not collected again.

FIG. 5. *Bryopsis hypnoides*: *a*, Habit of part of a plant of D. 13977, × 5; *b*, detail of branching of the same, × 45.

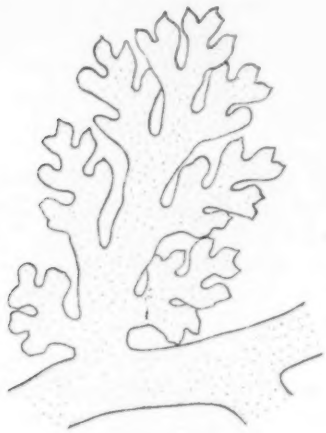


FIG. 6. *Caulerpa acuta*: A small part of a blade of D. 13875 to show ultimate branching, × 100.

Caulerpa elongata f. *disticha* Taylor 1950: 55, pl. 52, fig. 1; Dawson 1956: 37 (as *C. elongata*)

D. 13723. *Caulerpa elongata* is supposed to be distinguished from similar forms of *C. webbiana* by its more lax and erect habit and absence of the abundant ramified filaments from the stolons. However, this specific distinction needs study. Taylor's plant is probably the same as that treated as *C. webbiana* f. *elegans* by Yamada and Tanaka 1938: 62, fig. 4.

FIG. 7. *Caulerpa acuta*: A dry specimen of D. 13875, × 1.2.

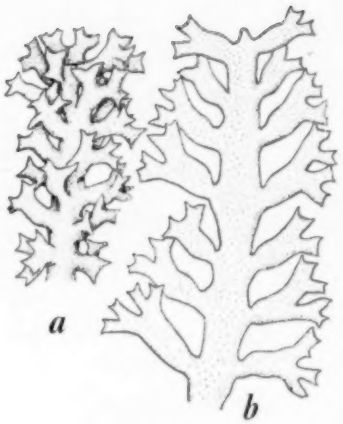


FIG. 8. *a*, *Caulerpa webbiana*: Upper part of a plant of D. 13679, × 22. *b*, *Caulerpa webbiana* f. *disticha*: Upper part of a plant of D. 13892, × 22.

Caulerpa webbiana Montagne 1838: 129, pl. 6 (Canary Islands); Eubank 1946: 415

Fig. 8*a*

D. 13679, 13807. P. 13, Igurin Is. seaward reef, 8/9/49.

Caulerpa webbiana var. *disticha* Weber van Bosse 1898: 270, pl. 21, fig. 1a–c (type locality not indicated)

Fig. 8*b*

D. 13626, 13850, 13864, 13892.

Caulerpa serrulata var. *serrulata* (Forskål) J. Agardh; Taylor 1950: 57, pl. 29, fig. 1, pl. 30, fig. 1; Dawson 1954: 393, fig. 10a; Dawson 1956: 38, fig. 23

D. 13952, 14047. P. 1225B, Parry Is. lagoon in 6 ft., 4/19/54.

Caulerpa racemosa var. *laetevirens* (Montagne) Weber van Bosse 1898: 366, pl. 33, figs. 8, 16–22; Taylor 1950: 64. *Caulerpa laetevirens* Montagne 1845: 16 (Toud Island)

Fig. 9*a*

D. 13628.

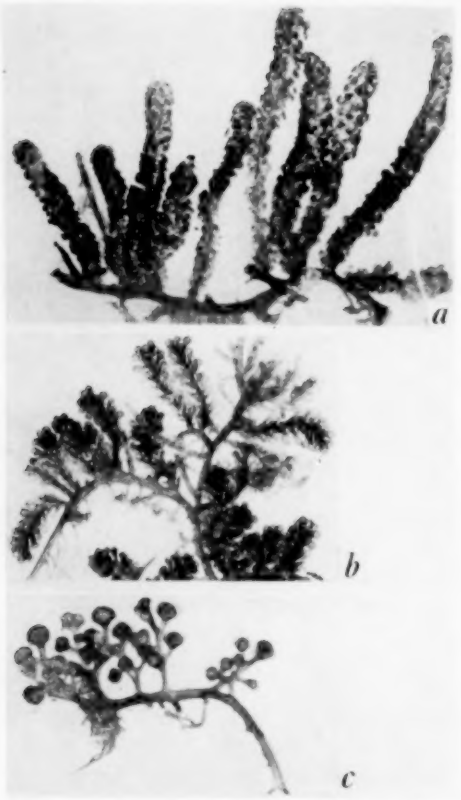


FIG. 9. *a*, *Caulerpa racemosa* var. *laetevirens*: Upper part of a plant of D. 13628, × 0.38. *b*, *C. racemosa* var. *laetevirens* f. *compressa*: Part of a plant of D. 13743, × 0.43. *c*, *C. racemosa* var. *clavifera*: A dry specimen of P. 12, × 0.75.

Caulerpa racemosa var. *laetevirens* f. *compressa* Taylor 1950: 64 (Eniwetok Atoll, Marshall Is.)

Fig. 9*b*

D. 13743, 13812.

Caulerpa racemosa var. *clavifera* (Turner) Weber van Bosse 1898: 361, pl. 33, figs. 1–5; Taylor 1950: 62. *Fucus clavifer* Turner 1808: 126, pl. 57 (Red Sea)

Fig. 9*c*

P. 12, Japtan Is. seaward reef, 8/8/49.

Caulerpa racemosa var. *peltata* (Lamouroux) Eubank; Dawson 1956: 35, fig. 16b; Taylor 1950: 65 (as *Caulerpa peltata* Lamx.)

D. 13735, 13793. The former have peltate foliar ramelli with dentate margins.

Caulerpa racemosa var. *peltata* f. *nummularia* (Harvey ex J. Agardh) comb. nov. *Caulerpa nummularia* J. Agardh 1872: 38 (Friendly Islands,-Tonga) *Caulerpa peltata* var. *nummularia* (J. Agardh) Weber van Bosse 1898: 376

Fig. 10

D. 13612, 13809. P. 2806, Parry Is. seaward reef, 3/6/55.

FIG. 10. *Caulerpa racemosa* var. *peltata* f. *nummularia*: Part of a plant of D. 13616b, × 4.5.

Caulerpa racemosa var. *macrophysa* (Kützing) Taylor; Dawson 1954: 393, fig. 10c; Dawson 1956: 35; Taylor 1950: 63

D. 13820. P. 1225, Parry Is. lagoon in 6 ft., 4/19/54.

Caulerpa racemosa (Forskål) J. Agardh near var. *uvifera* (Turner) Weber van Bosse 1898: 362, pl. 33, figs. 6, 7, 23; Taylor 1950: 63. *Fucus uvifer* Turner 1819: 81, pl. 230 (Red Sea)

D. 13635, 14006.

Caulerpa taxifolia (Vahl) C. Agardh; Dawson 1956: 35, fig. 17

D. 14046.

Caulerpa urvilliana Montagne; Taylor 1950: 60, pl. 31, figs. 1, 2, pl. 32, fig. 1; Dawson 1956: 37, fig. 21

D. 13607, 13632, 13674, 13757, 13818, 13845, 13862. P. 2824, Runo Is. seaward reef, 3/8/55; P. 2819, Bokanjoio Is. seaward reef, 3/8/55; P. 1225A, Parry Is. lagoon in 6 ft., 4/19/54. These specimens are variable, but for the most part approach the f. *tristicha* (J. Agardh) Weber van Bosse of the type variety of the species.

Caulerpa vickersiae Børgesen; Dawson 1956: 36, fig. 18; Dawson 1954: 392, fig. 9f (as *C. ambigua* Okam.)

D. 13617a, 13988a.

Codium arabicum Kützing; Dawson 1956: 38, fig. 24

D. 13947, 14004. P. 1220, Bogombogo Is. seaward flats, 4/15/54; P. 2831, off Igurin Is. in lagoon at 50 ft., 3/16/55.

Codium geppii O. C. Schmidt; Dawson 1954: 395, fig. 13 k; Dawson 1956: 39, fig. 26

D. 13722, 13951, 13926, 14003. P. 2593, Bogallua Is. lagoon, 2/11/55; P. 52–25, Aomon Is., 10/22/52.

Dr. Silva, in a personal communication, states that reef material of this plant collected by A. Conger and examined by him certainly belongs to the *C. geppii* complex, but is referable to *C. bulbopilum* Setchell, which he is about to decide to recognize in his monograph on *Codium*.

Codium edule Silva, mentioned by Odum and Odum (1955), has not been examined, but may be referable here.

Codium saccatum Okamura 1915: 145, pl. 135, figs. 1–5 (Futaye, Amakusa Island, Japan)

Fig. 11*a*

P. 2835, Bogombogo Is. on coral of tidal flats, 5/30/54. This plant agrees in size and shape and in the morphology of the utricles except for a slight development of alvaeolae in the utricle end-walls, not shown by Okamura for the type.

FIG. 11. *a*, *Codium saccatum*: A somewhat damaged plant of P. 2835, × 0.8. *b*, *Avrainvillea lacerata*: Habit of plants of D. 13629, × 1.05.

Codium tenue (Kützing) Kützing 1856, Tab. Phyc. 6: 33, pl. 95, fig. 1; Taylor 1950: 94. *Codium tomentosum* var. *tenue* Kützing 1849: 501 (Cape of Good Hope)

T. 46–436. Not collected again. Dr. Silva has reëxamined some preserved material of this collection and states in a personal communication that he considers it an undescribed species.

Pseudochlorodesmis furcellata (Zanardini) Børgesen; Dawson 1954: 395, fig. 11c

D. 13704b, 13987, 14048.

Avrainvillea lacerata Harvey ex J. Agardh 1887: 54 (Friendly Islands,-Tonga); A. and Ethel Gepp 1911: 38, figs. 105–109; Taylor 1950:70

Fig. 11*b*

D. 13629.

Rhipilia geppii Taylor 1950: 70, pl. 35 (Bikini Atoll, Marshall Islands)

D. 13721, 13889. P. 13x, Aaraanbiru Is. seaward reef margin, 3/7/54.

Rhipilia diaphana Taylor 1950: 72, pl. 37 (Bikini Atoll, Marshall Islands)

T. 46–425. Not collected again.

Rhipilia orientalis A. and Ethel Gepp; Taylor 1950: 72, pl. 36, fig. 1; Dawson 1956: 40

D. 13761, 13877, 13888.

Udotea palmetta var. *marshallensis* var. nov. Dawson 1956: 40, fig. 28a, b, c (as *U. palmetta*); Taylor 1950: 74 (as *U. indica*, at least in part)

Like the type, but the blade filament appendages in a single row, simple, blunt-conical, not forked.

A typo differt in appendiculis filamentae laminae in serie simplici efurcatis obtusi-conicis.

TYPE: Dawson 13727, Aniyaanii Island, seaward reef on the coralline ridge, August 22, 1955.

ADDITIONAL MATERIAL: Kwajalein Atoll. D. 12554; Majuro Atoll. Horwitz 9576, 9599c, 9340a, 9390e; Eniwetok Atoll. T. 46–386, D. 13829, D. 13634, D. 13894, P. 2588a, Bogallua Is. lagoon rock pavement, 2/11/55, P. 54–33, Mui Is. seaward reef, 3/11/54, P. 2581a, Aaraanbiru Is. s.w. tip in channel, 2/11/55.

This considerable number of specimens has been found to show such consistent minor differences in the form of the blade filament appendages from the Indian Ocean type that there appears to be ample justification for its recognition under a distinctive subspecific name. One of Taylor's Eniwetok specimens referred by him to *U. indica* has been examined and found to be identical with the other Marshall Islands material. Presumably, his Rongerik, Rongelap and Bikini specimens treated as *U. indica* are also of this same plant.

Udotea javensis (Montagne) A. and Ethel Gepp; Dawson 1954: 395, fig. 13b, c; Dawson 1956: 40; Taylor 1950: 73

D. 13694, 13787, 13949.

Tydemannia expeditionis Weber van Bosse; Dawson 1956: 41; Taylor 1950: 73, pl. 38, fig. 1

D. 13962, 13997.

Halimeda gigas Taylor 1950: 84, pl. 44, fig. 2 (Eniwetok Atoll)

D. 13948, 13968, 13996. P. 1996, ½ mile off Parry Is. in lagoon at 140 ft., 9/9/54; P. 1947, ¼ mi. off Parry Is. in lagoon at 135 ft., 9/4/54; P. 2625, Parry Is. lagoon at 100 ft., 3/14/55; P. 2688, 1½ mile off Rigili Is. in lagoon at 60 ft., 3/16/55.

Halimeda macrophysa Askenasy 1888: 14, pl. 4, figs. 1–4 (Matuku Is., South Pacific); Barton 1901: 17, pl. 2, figs. 15–18

Fig. 12

D. 13879, 13897.

Halimeda monile (Solander) Lamouroux; Taylor 1950: 92, pl. 50, fig. 1; Dawson 1956: 41

D. 13706, 13836, 13937, 13953, 13969. P. 2828, 1½ mi. off Igurin Is. in lagoon at 50 ft., 3/8/55; P. 1993, ½ mi. off Parry Is. in lagoon at 140 ft., 9/9/54; P. 2687, 1½ mi. off Rigili Is. in lagoon at 60 ft., 3/16/55; P. 2620, 1½ mi. off Aaraanbiru Is. in lagoon at 70 ft., 3/11/55.

Halimeda lacunalis Taylor 1950: 91, pl. 51 (Eniwetok Atoll)

P. 2814, Bokanjoio Is. in lagoon off s.e. end of island at 60 ft., 3/8/55.

Halimeda stuposa Taylor 1950: 90, pl. 43, fig. 1, pl. 49, pl. 50, fig. 2 (Rongelap Atoll, Marshall Islands); Dawson 1956: 41

P. 2807, Parry Is. seaward reef edge, 3/6/55; P. 1200, Eneroul Is. lagoon, 4/14/54; P. 52–23, Aomon Is. lagoon at 5 ft., 10/22/52; P. 2588, Bogallua Is. lagoon rock pavement, 2/11/55.

Halimeda fragilis Taylor 1950: 88, pl. 48, fig. 2; Dawson 1956: 41

T. 46–394. Not collected again.

Halimeda opuntia (Linnaeus) Lamouroux; Taylor 1950: 80, pl. 39, fig. 1; Dawson 1954: 395, fig. 12; 1956: 41

D. 13631, 13700, 13734, 13796. P. 2529, 2530, ¼ mi. off Aaraanbiru Is. in lagoon at 20 ft., 3/9/55.

Halimeda opuntia f. *hederacea* Barton 1901: 21, pl. 3, fig. 23 (East Indies); Taylor 1950: 81, pl. 40, fig. 1; Dawson 1956: 42

D. 13954, 13998. P. 1950, ¼ mi. off Parry Is. in lagoon at 135 ft., 9/4/54.

Halimeda opuntia f. *minima* Taylor 1950: 82, pl. 39, fig. 2 (Bikini Atoll, Marshall Islands)

D. 14001.

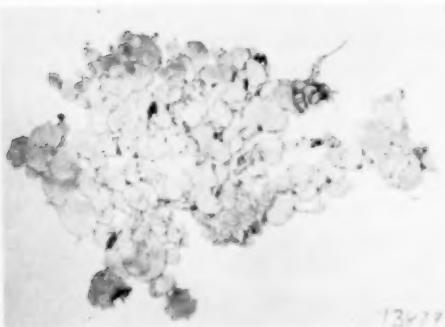


FIG. 12. *Halimeda macrophysa*: Habit of a plant of D. 13879, × 0.5.

Halimeda opuntia f. *triloba* (Decaisne) Barton 1901: 20, pl. 2, fig. 20; Taylor 1950: 81, pl. 40, fig. 2. *Halimeda triloba* Decaisne 1842: 90 (China Sea)

D. 14001a. P. 2618, 1 mi. off Aaraanbiru Is. in the lagoon at 70 ft., 3/11/55.

Halimeda taenicola Taylor 1950: 86, pl. 46, fig. 1; Dawson 1956: 42

D. 13759.

Halimeda tridens f. *lamourouxii* (J. Agardh) Weber van Bosse; Taylor 1950: 93. *Halimeda incrassata* var. *lamourouxii* J. Agardh 1887: 86 ("in mari Antillarum"); Barton 1901: 27, pl. 4, fig. 41

Fig. 13

D. 14044.

FIG. 13. *Halimeda tridens* f. *lamourouxii*: Habit of a plant of D. 14044, × 0.45.

Ostreobium reineckii Reinbold; Dawson 1954: 396, fig. 13g

D. 13776a, growing in the calcareous material of the lower side of *Peyssonelia rubra* var. *orientalis*.

Neomeris bilimbata Koster; Dawson 1956: 42, fig. 30a, b

D. 13772. Taylor's number 46–557 from Rongerik Atoll has been reëxamined and found to agree with this species rather than with *Neomeris vanbosseae* Howe.

Acetabularia moebii Solms-Laubach; Dawson 1954: 397, fig. 13j; Dawson 1956: 43
D. 13617b, 13660, 13858.

BROWN ALGAE

Ectocarpus breviarticulatus J. Agardh; Dawson 1954: 398, fig. 14a, b; Dawson 1956: 43
D. 13620, 14037. P. 2803, Bokanjoio Is. seaward reef margin, 10/25/54; P. 2804, Parry Is. seaward reef flats, 2/5/55.

Ectocarpus indicus Sonder, in Zollinger; Dawson 1956: 43, fig. 32; Taylor 1950: 95
D. 13766, epiphytic on *Turbinaria*, 13950, epiphytic on *Halimeda* and *Caulerpa*, 13959.

Ectocarpus irregularis Kützing; Dawson 1954: 398, fig. 14e, f; Børgesen 1941: 23, figs. 8–11
P. 2854a, epiphytic on *Dictyota*, Bogallua Is. lagoon pavement, 11/17/54.

Ectocarpus mitchellae Harvey; Taylor 1950: 95; Dawson 1954: 400, fig. 14c, d; Dawson 1956: 43; Børgesen 1941: 7, figs. 1–5
D. 13979.

Sphacelaria furcigera Kützing; Dawson 1954: 400, fig. 14h; Dawson 1956: 44
D. 13696a.

Sphacelaria novae-hollandiae G. Sonder; Dawson 1954: 400, fig. 14g; Taylor 1950: 97
D. 13748, 13768, 13936, all epiphytic on *Turbinaria*.

Sphacelaria tribuloides Meneghini; Dawson 1954: 400, fig. 14i, j; Dawson 1956: 44
D. 13622. P. 2812, Bokanjoio Is. lagoon on stake in 3 to 8 feet of water, 3/8/55.

Pocockiella papenfussii Taylor 1950: 98, pl. 54, fig. 2; Dawson 1956: 44
D. 13720. P. 54–31, Mui Is. seaward reef under rocks, 3/11/54.

Pocockiella variegata (Lamouroux) Papenfuss; Dawson 1954: 400, fig. 14k; Dawson 1956: 44
D. 13775, 13866.

Dictyota divaricata Lamouroux 1809: 331 (Mediterranean coast of France); Taylor 1928: pl. 16, figs. 6–9; Taylor 1950: 101

Fig. 14*a*

D. 13614 (juvenile), 13691, 13883, 13898. P. 2690, 1½ mi. off Rigili Is. at 60 ft., 3/16/55.

Dictyota patens J. Agardh; Dawson 1954: 401, fig. 16c
D. 13938. P. 2854, Bogallua Is. lagoon pavement, 11/17/54.

Dictyota pinnatifida Kützing 1859, Tab. Phyc. IX: 16, pl. 39 (Antigua, West Indies); Taylor 1950: 100
T. 46–416. Not collected again.

Dictyopteris repens (Okamura) Børgesen; Dawson 1956: 44, fig. 34
D. 13611, 13749.

Padina australis Hauck 1887: 44 (Cape York, North Australia); Weber van Bosse 1913: 179, fig. 52

Fig. 14*b*

D. 13678.

Padina commersonii Bory; Dawson 1954: 401, fig. 17; Taylor 1950: 100, pl. 54, fig. 1; Dawson 1956: 44
D. 13830, 14045. In this species the fertile zones alternate with hair zones, while in *P. australis* each fertile zone has a hair zone on either side separated from the next hair zone by a sterile zone.

Hydroclathrus clathratus (Bory) Howe; Dawson 1954: 403, fig. 18b; Taylor 1950: 96
D. 13918, 14021. P. 2845, Bokanjoio Is. seaward boat passage in 6 ft., 9/30/54.

FIG. 14. *a*, *Padina australis*: Habit of a plant of D. 13678, × 0.8. *b*, *Dictyota divaricata*: Habit of parts of plants of D. 13691 showing great attenuation of some segments, × 0.7.

Rosenvingea intricata (J. Agardh) Børgesen 1914: 181; Taylor 1950: 97 *Asperococcus intricatus* J. Agardh 1847: 7 (Vera Cruz, Mexico)

Fig. 15

D. 13919. Rather dwarfish material which most closely resembles plants from the Gulf of California (Dawson 1944).

Rosenvingea fastigiata (Zanardini) Børgesen 1914: 26; Taylor 1950: 96, pl. 52, fig. 2. *Asperococcus fastigiatus* Zanardini 1872: 134, pl. 3, figs. 1–3 (Sarawak)

T. 46–332. Not collected again.

Chnoospora implexa Hering ex J. Agardh; Dawson 1954: 404, fig. 20a, b

D. 14022. P. 1195, Bokanjoio Is., seaward reef margin, 4/14/54.

Turbinaria ornata (Turner) J. Agardh; Dawson 1954: 405, fig. 21; Dawson 1956: 44; Taylor 1950: 100, pl. 53, fig. 2, pl. 55, fig. 2

D. 13693, 13765, 13802, 13935.

RED ALGAE

Goniotrichum elegans (Chauvin) Zanardini 1847: 69. *Bangia elegans* Chauvin 1842: 32 (Arromanches, France). Taylor 1950: 117 (as *G. alsidii* (Zanard.) Howe)

Fig. 16*a*, *b*

D. 13696e, epiphytic on a bit of *Cladophora* among other small algae in mixture.

Asterocytis ornata (C. Agardh) Hamel; Dawson 1954: 411, fig. 23a; Taylor 1950: 116

T. 46–427. Not detected again.

Erythrotrichia carnea (Dillwyn) J. Agardh; Dawson 1956: 45; Taylor 1950: 117; Tanaka 1952: 14, fig. 7B–E

Fig. 16*c*

D. 13906a.

Erythrotrichia parietalis Tanaka; Dawson 1954: 412, fig. 23d, e

D. 13696c.

Acrochaetium gracile Børgesen; Dawson 1954: 414, fig. 25h, i

Fig. 17*b*

D. 13696b, epiphytic on *Lophosiphonia* and

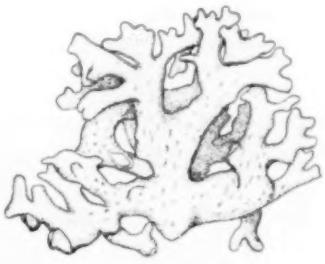


FIG. 15. *Rosenvingea intricata*: Habit of part of a small plant of D. 13919, × 3.7.

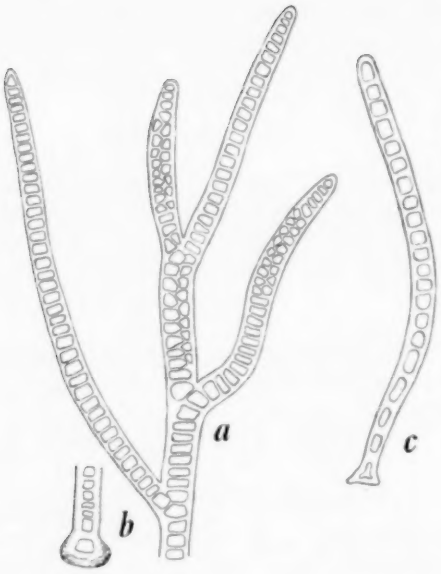


FIG. 16. *a*, *b*, *Goniotrichum elegans*: *a*, Habit of the upper part of a plant; *b*, basal part of same, both × 150 (after Børgesen). *c*, *Erythrotrichia carnea*: Habit of a young plant, × 300 (after Tanaka).

other small algae. This material seems to agree even better with the original account than the Viêt Nam specimens cited above. Attenuated hairs are common.

Acrochaetium robustum Børgesen; Dawson 1954: 414, fig. 25j, k

P. 2847, Bokanjoio Is. lagoon on *Enteromorpha*, 9/29/54.

Kylinia crassipes (Børgesen) Kylin 1944: 13. *Acrochaetium crassipes* Børgesen 1915: 20, figs. 11–13 (Virgin Islands)

Fig. 17*a*

D. 13620b, epiphytic on small algae.

Kylinia secundata (Lyngbye) Papenfuss 1947: 437. *Callithamnion daviesii* var. *secundatum* Lyngbye 1819: 129 (Denmark)

Fig. 17*c*, *d*

D. 13976b. Rather scant material, but fertile and in general agreement with the species as interpreted by the writer in 1953.

Liagora farinosa Lamouroux; Dawson 1954: 415, figs. 25d, 26; Taylor 1950: 119

P. 2820, Bokanjoio Is. seaward reef edge, 3/8/55.

Liagora hawaiiana Butters 1911: 164, pl. 24, figs. 8, 9 (Laie Bay, Oahu, Hawaiian Islands); Taylor 1950: 119, pl. 57, fig. 1; Abbott 1945: 151, fig. 3

D. 13828.

Liagora orientalis J. Agardh; Dawson 1954: 415, fig. 27b

Fig. 19*a*, *b*

A. Conger 4/27/51, Lidilibut Is., among coral heads in sandy channels on the ocean side. Principal specimen in the Bishop Museum. The material is sterile and is not positively identified.

Liagora pinnata Harvey 1853: 138, pl. 31 B, figs. 1–5 (Sand Key, Florida); Abbott 1945: 168

Fig. 18

P. 54–19, Aitsu Is., seaward reef near edge, 3/10/54.

Liagora robusta Yamada 1938: 8, pl. 12, fig. 1, text figs. 3, 4 (Ogasawara Islands)

Fig. 19*c*, *d*

A. Conger 4/27/51, Lidilibut Is. in sandy channels on the ocean reef side. Sterile and not positively identified.

Asparagopsis taxiformis (Delile) Collins and Hervey 1917: 117. *Fucus taxiformis* Delile 1813: 295, pl. 57, fig. 2 (Alexandria, Egypt)

Fig. 20

D. 13627, 13843, 14018. P. 16, Japtan Is. seaward reef, 8/8/49; P. 2601a, Rigili Is., 2/11/55; P. 2501, Engebi Is. lagoon at n.w. tip in 15 ft., 3/2/55.

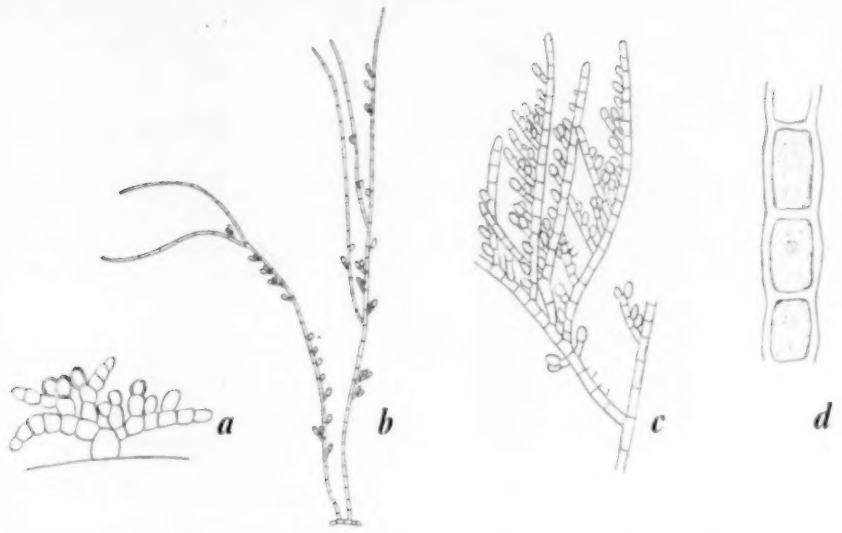


FIG. 17. *a*, *Kylinia crassipes*: Habit of a plant, × 290. *b*, *Acrochaetium gracile*: Habit of part of a plant, × 150 (after Børgesen). *c*, *d*, *Kylinia secundata*: *c*, Habit of the upper part of a plant, × 160; *d*, detail of stellate chromatophores in part of a filament, × 1000 (after Dawson).

Falkenbergia hillebrandii (Bornet) Falkenberg = sporophyte generation of *Asparagopsis taxiformis* (Delile) Collins and Hervey; Dawson 1954: 414, fig. 25l; Dawson 1956: 45
D. 13623, 13913, 14018a. P. 2836b, Parry Is. seaward reef edge, 4/4/54.

Galaxaura fastigiata Decaisne; Dawson 1954: 419, fig. 30b
P. 2805, Bogombogo Is. seaward reef flats, 2/9/55.

Galaxaura filamentosa Chou; Dawson 1954: 419, fig. 30a; Dawson 1956: 46
D. 14005. Rather scant, young material.

Gelidium crinale var. *perpusillum* Piccone and Grunow; Dawson 1954: 421, fig. 31e, f
D. 13798.

Gelidium pusillum (Stackhouse) Le Jolis, formas; Dawson 1954: 420, fig. 31a–c; Dawson 1956: 46
D. 13819, 13841.

Gelidiella bornetii (Weber van Bosse) Feldmann and Hamel 1934: 528; Børgesen 1938: 210, fig. 2a, b. *Gelidium bornetii* Weber van Bosse 1926: 107 (Kei Islands)

Fig. 21

D. 14035 is a good match for Børgesen's 1938 figure. The small size and compressed to flattened branches lacking rhizoidal filaments are distinctive.

Gelidiella tenuissima Feldmann and Hamel; Dawson 1954: 422, fig. 33e; Dawson 1956: 46
D. 13660a, 13908, 14032.

Gelidiopsis intricata (C. Agardh) Vickers; Dawson 1954: 423, fig. 34a–d; Dawson 1956: 46
D. 13903.

Wurdemannia miniata (Lamark and DeCandelle) Feldmann and Hamel: Dawson 1954: 424, fig. 35; Dawson 1956: 47
D. 13640b, 14036.

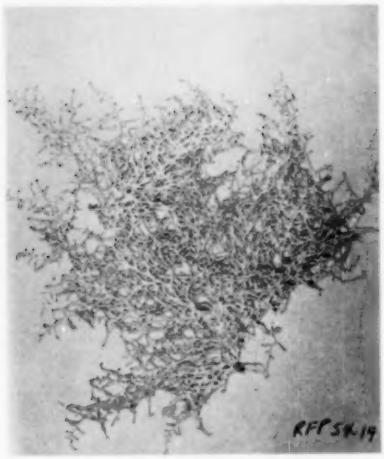


FIG. 18. *Liagora pinnata*: Habit of a dry specimen of P. 54–19, × 0.65.

Cruoriella dubyi (Crouan and Crouan) Schmitz; Dawson 1956: 47, fig. 39
D. 13856.

Peyssonelia rubra var. *orientalis* Weber van Bosse; Dawson 1954: 424, fig. 36c; Dawson 1956: 47; Taylor 1950: 121
D. 13776, 13991.

Porolithon craspedium (Foslie) Foslie 1909: 57; Taylor 1950: 126, pls. 64, 65. *Lithophyllum craspedium* Foslie 1900: 26 (Onatoa, Gilbert Islands)
D. 13717, 13943.

Porolithon oncodes (Heydrich) Foslie 1909: 57; Taylor 1950: 125, pls. 9, 61, 62, 63. *Lithophyllum oncodes* Heydrich 1897: 410 (Tami Island, New Guinea)
D. 13618, 13869, 14019.

Porolithon gardneri f. *subhemispherica* Foslie 1907: 190 (Indian Ocean); Taylor 1950: 129, pls. 5–9, 70, fig. 1; pls. 71–73, 76, fig. 2; pl. 77
T. 46–373, T. 46–306, T. 46–406. Not collected again since 1946.

Fosliella farinosa (Lamouroux) Howe; Dawson 1954: 425, fig. 37c; Taylor 1950: 132 (as *F. farinosa* var. *solmsiana* (Falkenb.) Taylor, prox.
D. 13720a, epiphytic on *Pocockiella*.

Heteroderma minutula Foslie; Dawson 1956: 47, fig. 40
D. 13719a, 13821, both epiphytic on *Dictyosphaeria intermedia*; D. 13994a, epiphytic on *Valonia*.

Heteroderma subtillissima Foslie; Dawson 1956: 48, fig. 41a, b
D. 13857b, in *Jania* turf; D. 13818, epiphytic on *Caulerpa urvilliana*.

Jania capillacea Harvey; Dawson 1954: 432, fig. 41a, b; Dawson 1956: 49; Taylor 1950: 133
D. 13640, 13649, 13692. P. 2858, Runit Is. in channel at n.w. tip, 4/11/54.

Jania decussato-dichotoma (Yendo) Yendo; Dawson 1956: 49, fig. 44
D. 13769, 13805, 13910. The specimens cited by Taylor 1950: 133 under *Jania rubens* Lamx. are presumed to correspond with this common Pacific species.

Jania micrarthrodia Lamouroux; Dawson 1956: 49, fig. 42; Taylor 1950: 134 (as *J. antennina* Kützing, prox.)
T. 46–345B. Not collected again.

Jania tenella Kützing; Dawson 1956: 49, fig. 43
P. 2836a, Parry Is. seaward reef edge, 4/4/54; P. 2860, same, 3/10/54.

Grateloupia filicina (Wulfen) C. Agardh; Dawson 1954: 432, fig. 42a
D. 13972. P. 2837, same locality, 5/29/54.

Hypnea esperi Bory; Dawson 1954: 436, fig. 46h–j; Dawson 1956: 51
D. 13617, 13697, 13788, 13852, 13814, 13902, 13939, 14015. Taylor's Eniwetok col-

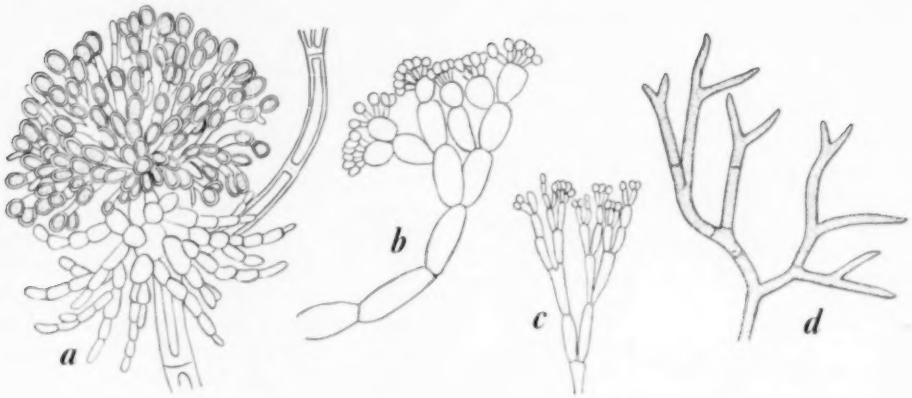


FIG. 19. *a*, *b*, *Liagora orientalis: a*, A young cystocarp, × 300; *b*, an antheridial branch, × 470 (both after Yamada). *c*, *d*, *Liagora robusta: a*, An antheridial branch, × 350 (after Yamada); *b*, part of a plant of Conger 4/27/51 showing the open dichotomous branching and annulations, × 1.5.

FIG. 20. *Asparagopsis taxiformis*: Habit of dry plants typical of the small reef form, × 1.15.

lection of *Hypnea* under no. 46–378 called *H. spinella* (Ag.) Kütz. is probably the same as these.

Hypnea nidulans Setchell; Dawson 1954: 438, fig. 46e–g
D. 13861.

Hypnea pannosa J. Agardh; Dawson 1956: 51, fig. 46
D. 13912.

Dicranema rosaliae Setchell and Gardner 1924: 745, pl. 22, fig. 6 (Gulf of California, Mexico)
Figs. 22*a*; 23*a*
D. 13980.

Botryocladia skottsbergii (Børgesen) Levring; Dawson 1956: 52, fig. 48; Taylor 1950: 135 (as *Botryocladia kuckuckii* Weber van Bosse) Yamada and Tanaka
D. 13986, 14033.

Coelothrix irregularis (Harvey) Børgesen 1915–20: 389, figs. 373, 374. *Cordylecladia ? irregularis* Harvey 1853: 156 (Key West, Florida)
Fig. 23*b*

D. 13782. The tetrasporic material agrees exactly with Harvey. It is probably identical also with *C. indica* Børgesen from Mauritius which seems doubtfully distinct in view of this Pacific record. The species is probably widespread in tropical waters but of infrequent occurrence in the Pacific and Indian Ocean regions.

FIG. 21. *Gelidiella bornetii*: Habit of part of a plant of D. 14035, × 9.

Lomentaria hakodatensis Yendo; Dawson 1956: 52, fig. 50
D. 13709, 13853, 13928, 13999i, 14025.

Champia parvula (C. Agardh) Harvey; Dawson 1954: 443, fig. 52c; Dawson 1956: 51
D. 13746, 13849, 14015a.

Champia vieilardii Kützing ?; Dawson 1954: 443, figs. 52e, 53; Dawson 1956: 51
D. 13999f. A small fragment only of uncertain identity.

Rhodymenia anastomosans Weber van Bosse; Dawson 1956: 52, fig. 49
D. 13900.

Antithamnion lherminieri (Crouan and Crouan) Nasr; Dawson 1956: 53, fig. 51
D. 13609a, creeping among other minute algae; 13696b, 13950b, epiphytic on *Halimeda* and *Caulerpa;* 13999b, epiphytic on *Halimeda*.

Antithamnion percurrens sp. nov.

Fig. 24*a*, *b*

Thalli minute, densely tufted, 5–6 mm. high, uniseriate throughout; creeping, prostrate filaments of lower parts fastened to the calcareous substrate by short lateral branchlets modified for attachment; main axes both prostrate and erect about 15–18 μ in diameter, of cells mostly 2–3 diameters long; erect axes strongly percurrent, without indeterminate branches; determinate lateral branchlets regularly distichous from every axial cell, 60–120 μ long, symmetrically curved upward, commonly bearing 1–3 short, 1–2 celled secondary determinate branchlets on the adaxial side; all branch tips blunt; tetrasporangia about 20 μ in diameter, tripartite, sparse, sessile, borne within a large, prominent, gelatinous envelope from the adaxial side of the basalmost cell of a lateral branchlet, usually causing a local disarrangement of the pinnae because of the size of the envelope.

Thallis 5–6 mm. altis in omnis partibus uniseriatis, axilibus principalibus valde percurrentibus 15–18 μ diametro cellulis plerumque 2–3-plo longioribus quam latis,

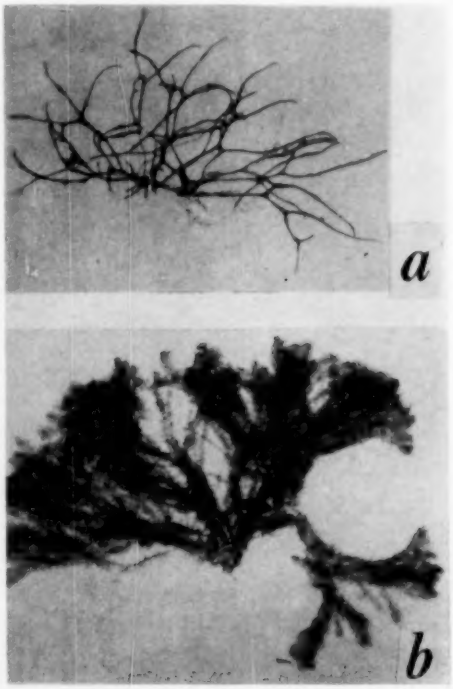


FIG. 22. *a*, *Dicranema rosaliae*: Habit of a dry plant of D. 13980, × 1.7. *b*, *Dasya iyengarii*: Habit of part of a dried tuft of a somewhat robust form, × 2.0.

FIG. 23. *a*, *Dicranema rosaliae*: Transection of a branch to show central core of small cells (after Setchell and Gardner). *b*, *Coelothrix irregularis*: Habit of part of a tetrasporic plant of D. 13782 with stichidia, × 10.

ramulis lateralibus determinantibus regulariter distichis ex cellulis axilaribus omnibus salientibus 60–120 μ longis adscendenti-curvatis et in latere adaxilare ramulis determinantibus secundariis productis, apicibus ramorum obtusis, tetrasporangiis ca. 20 μ diametro tripartitis sessilibus sparsis e latere adaxiali cellulae inferioris ramulis lateralibus productis.

TYPE: Dawson 13633, forming tufts on crustose coralline algae near the outer margin of the seaward reef opposite EMBL, Parry Island, August 19, 1955.

This plant is related to *Antithamnion pteroton* Schousb. ex Bornet, but is a markedly distinct species in its percurrent erect axes, its large, sessile sporangia, and the short, symmetrical pinnae lacking any abaxial secondary branchlets.

Antithamnion breviramosus* var. *simplex var. nov.

Fig. 24*c*, *d*

Like the type, but more delicate and slender with main axes only 25–30 μ in diameter, and with lateral branchlets simple or only once forked; axial cells longer, 6–8 (10) diameters long; attachment by a short, 1–2 celled rhizoidal outgrowth from the lowermost cell of a lateral branch.

A typo simili sed axilibus principalibus tantum 25–30 μ diametro et cellulis longioribus 6–8 (10)-plo longioribus quam latis, ramulis lateralibus simplicibus vel unifurcatis.

TYPE: Dawson 13704a, creeping on *Griffithsia tenuis* from coral heads at a depth of 10 feet in the lagoon, south end of Parry Island, August 21.

This tiny plant is remarkably similar to that described from Santa Catalina Island, California (Dawson 1949: 14, figs. 28, 57) and seems to be only a more delicate, lax, and less-branched variant of that species.

Callithamnion marshallensis sp. nov.

Fig. 25*a–c*

Thalli attached to other algae or to shells or debris, loosely tufted, 4–5 mm. high, consisting of an irregularly semi-prostrate part attached by modified lateral branchlets with adherent terminal discs, some of the attachment branchlets distinctly catenate in their cell form and unlike vegetative branchlets; main axes 80–90 μ in diameter, noncorticated, of cells 1–1½ diameters long; lateral branchlets 20–30 μ in diameter, lax, long, somewhat attenuate but terminally blunt, mostly simple, curved, alternate, but not always from every cell, mostly spirally arranged, often with approximately ⅕ divergence, but sometimes in part tending to be distichous; tetrasporangia tripartite, subspherical, about 40 μ in diameter, sessile and

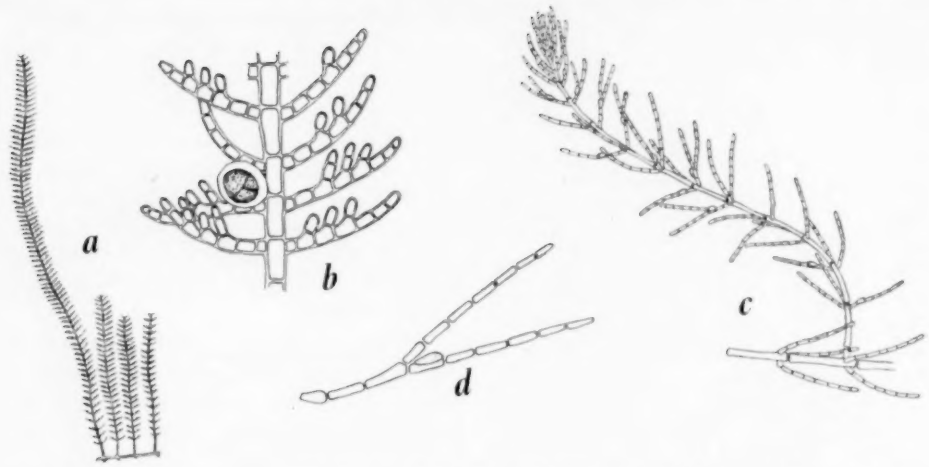


FIG. 24. *a, b, Antithamnion percurrens: a,* Habit of part of a plant of the type collection, × 13; *b,* part of a plant bearing a tetrasporangium, × 150. *c, d, Antithamnion breviramosus* var. *simplex: c,* Habit of part of a plant of the type collection, × 68; *d,* detail of an ultimate forked branch bearing a gland cell, × 300.

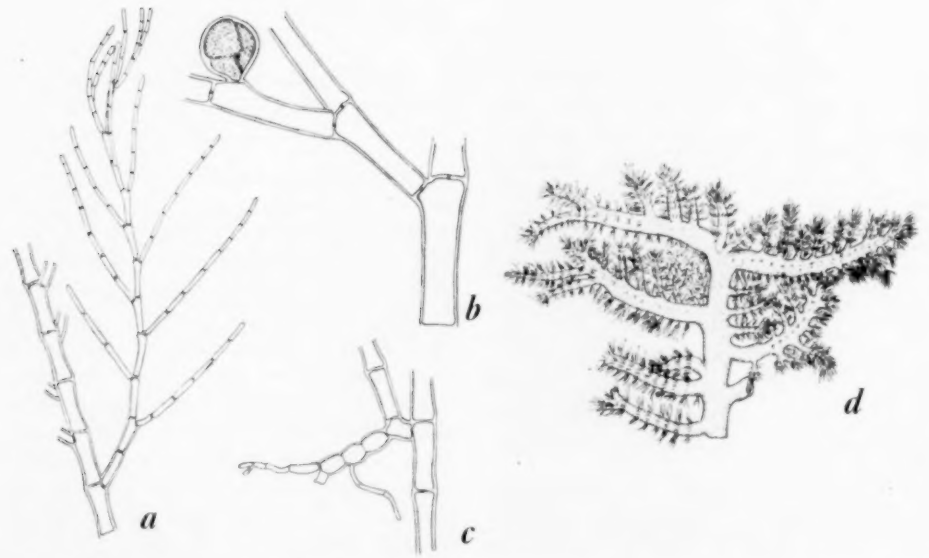


FIG. 25. *a–c, Callithamnion marshallensis: a,* Part of a plant of D. 13698a to show branching habit, × 70; *b,* detail of a branch bearing a tetrasporangium, × 162; *c,* detail of a lower part of a plant showing a catenate holdfast branch, × 60. *d, Wrangelia anastomosans:* Habit of part of a plant of P. 79a, as seen from the lower side, × 3.

adaxial, one or several in the lower half of a lateral branchlet in mid-parts of thallus.

Thallis 4–5 mm. altis, partibus inferis semiprostratis a ramulis lateralibus mutatis in discis adhaerentibus, axilis principalibus 80–90 μ diametro ecorticatis et cellulis 1–1½-plo longioribus quam latis, ramulis lateralibus 20–30 μ diametro laxis subattenuatis sed obtusis plerumque simplicibus curvatis alternatis plerumque contorte affixis, tetrasporangiis tripartitis ca. 40 μ diametro sessilibus adaxialibus in dimidia parte infera ramulae lateralis in media thalli affixis.

TYPE: Dawson 13695, on shells and dead coral from a depth of 6–10 feet in the lagoon, south end of Parry Island, Eniwetok Atoll, August 21.

ADDITIONAL MATERIAL: D. 13992, under rocks on reef along passage; D. 13950a, epiphytic on *Halimeda* and *Caulerpa*; D. 13997c, epiphytic on *Halimeda*; D. 13698a.

This species is seemingly nearest to *Callithamnion paschalis* Børgesen (1924: 294, fig. 35) from Easter Island, but is neither consistently distichously branched like that species nor with the tetrasporangia borne in the terminal branchlets of the main axes.

Wrangelia anastomosans Yamada 1944: 41, pl. 7, fig. 2 (Ant Atoll, Caroline Islands)

Fig. 25*d*

P. 79a, Igurin Is. tide flats in shallow water, 11/4/54.

Wrangelia argus (Montagne) Montagne; Dawson 1954: 444, fig. 54g; Dawson 1956: 56

D. 13941. This material agrees with the details by which Tseng (1942) differentiates *W. argus* from *W. tayloriana* Tseng, and lacks the more or less complete cortication of *W. penicillata*. The involucral filaments are about 11–13 μ in diameter, of 3 to 5 cells, often dichotomous and strongly curved. The tetrasporangia are 70–80 μ in diameter at maturity.

Wrangelia penicillata C. Agardh 1828: 138 (Adriatic Sea); Taylor 1950: 136

T. 46–336. Not collected again.

Griffithsia ovalis Harvey 1862, vol. 4: pl. 203 (King Georges Sound, West Australia); Abbott 1946: 440, pl. 1, figs. 1–4, pl. 2, figs. 1, 2

Fig. 26*a–d*

D. 14012, fertile. Several other sterile collections were made of a *Griffithsia* which is probably this species.

Griffithsia tenuis C. Agardh; Dawson 1954: 450, fig. 56e; Dawson 1956: 56

D. 13702, 13785, 13950d, 13956, 14029.

Neomonospora pedicellata var. *tenuis* Feldmann-Mazoyer; Dawson 1954: 450, fig. 56a

D. 13610a.

Ceramium clarionense Setchell and Gardner; Dawson 1954: 448, fig. 55k; Dawson 1956: 54

D. 13767. This material, epiphytic on *Turbinaria*, is sterile, but the circinate tips and

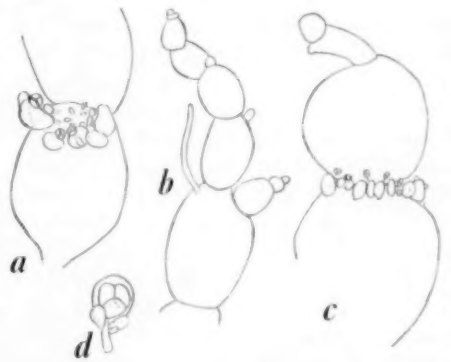


FIG. 26. *a–d*, *Griffithsia ovalis*: *a*, Vegetative cells with involucrate tetrasporangia between articulations, × 30; *b*, habit of part of a specimen with a rhizoid, × 16; *c*, involucrate tetrasporangia near the top of a plant, × 26; *d*, a mature tetrasporangium on a pedicel, × 300 (all after Abbott).

the peculiar exudation droplets from certain cortical cells seem to mark it clearly.

Ceramium marshallense sp. nov.

Fig. 27*a*, *b*

Thalli creeping and entangled among other algae in low turfs, 1 cm. or less in extent, consisting of creeping lower parts fastened to surrounding materials by numerous rhizoids, and free branches 4–5 mm. long; branching primarily dichotomous, with occasional irregular secondary branches; sterile apices strongly forcipate and usually circinately inrolled; main axes to 140–155 μ in diameter; cortication incomplete, consisting of nodal bands about 50–60 μ wide separating uncorticated internodal areas 40–70 μ wide; cortical bands consisting of a central ring of larger, isodiametrical cells about 22–30 μ in diameter and on either side, or somewhat overlapping, an irregular single to double ring of smaller angular cells 10–17 μ in greatest diameter; fertile, outer, erect parts of tetrasporangial plants somewhat catenately swollen, 160–185 μ in diameter; tetrasporangia mostly completely immersed beneath the tumid cortex, 35–40 μ in diameter, whorled after an initial tendency to be abaxial; sexual reproduction unknown.

Thallis repentibus et implicatis ad 1 cm. longis a rhizoideis multis affixis, ramis solutis 4–5 mm. longis, ramulis plerumque dichotomis, apicibus circinatis, axilibus principalibus 140–155 μ diametro, cortice interrupta, vittis corticalibus noduloris ca. 50–60 μ latis

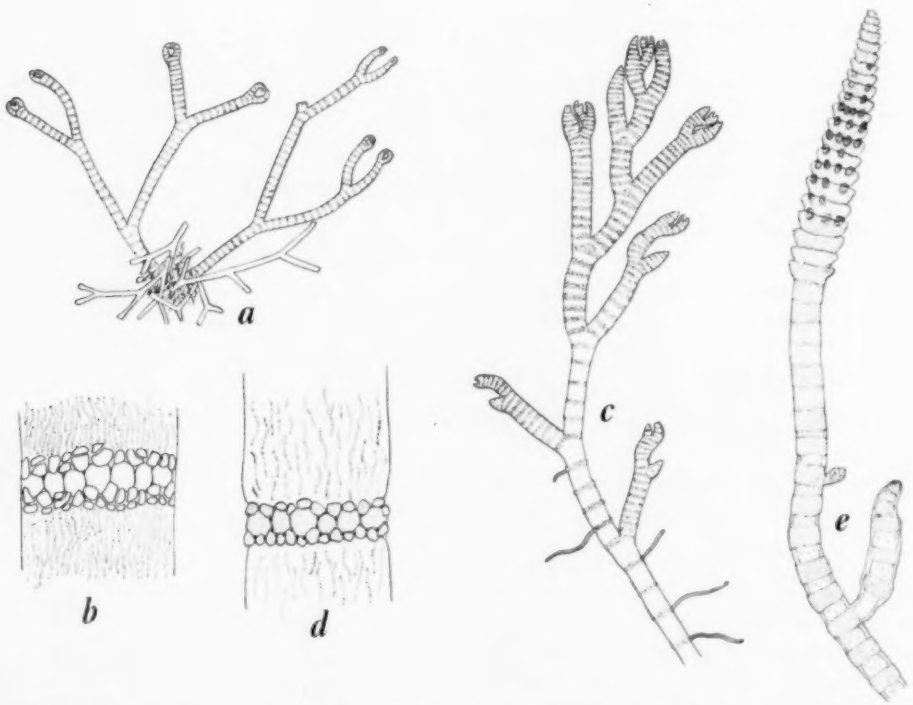


FIG. 27. *a*, *b*, *Ceramium marshallense: a*, Habit of a plant of the type collection, × 12; *b*, detail of a node of the same, × 150. *c*, *d*, *Ceramium sympodiale: c*, Habit of a plant of the type collection, × 26; *d*, detail of a node of the same, × 150. *e*, *Ceramium vagabunde:* Habit of the upper part of a tetrasporangial plant of the type collection, × 34.

a circulo unico cellulis majoribus 22–30 μ diametro et in lateribus ambis circulo irregulari cellulis minoribus angulosis 10–17 μ diametro, internodis 40–70 μ latis, tetrasporangiis 35–40 μ diametro verticillatis plerumque tota immersis sub cortice tumidi.

TYPE: Dawson 14013, growing in a *Jania* turf among rocks near the northern seaward reef edge of Rigili Island, Sept. 2.

This species is distinct in its small size, circinate apices, narrow cortical bands less than one-half as tall as broad, and in its immersed, whorled tetrasporangia. It approaches *C. mazatlanense* Dawson, but differs in the cellular arrangement of the cortical bands and in the whorled, immersed tetrasporangia.

Ceramium sympodiale sp. nov.

Fig. 27*c*, *d*

Thalli 1 cm. or less in height or extent, with main axes 110–130 μ in diameter, consisting of repent or entangled lower parts growing amid other small algae in tufts or turfs, attached at many places by rhizoids from the nodes, giving rise to erect, free parts 3–4 mm. high; branching sympodial and essentially distichous, the branches approximate above and becoming more widely spaced below by elongation of the internodes; branches at extreme apices at first more or less corymbose and the tips slightly forcipate with clearly visible apical cells; cortication incomplete, in narrow bands 35–40 μ wide (⅓ the diameter of the axis or less), consisting of a single ring of larger cells about 30–35 μ in diameter with smaller, angular cells on either side; internodes very narrow in upper parts, about 10 μ wide, expanding below to as much as 170 μ; reproduction not seen.

Thallis ad 1 cm. latis, axilibus principalibus 110–130 μ diametro, partibus inferis repentibus a rhizoideis noduloris affixis, partibus solutis 3–4 mm. altis, ramis sympodialibus et plerumque distichis ad apices corymbosis, apicibus subforcipatis, cortice interrupti vittis corticosis nodi 35–40 μ latis a circulo unico cellulis majoribus 30–35 μ diametro et in lateribus ambis cellulis minoribus anguloris, inter nodis supra angustioribus ca. 10 μ latis infra latioribus ad 170 μ latis.

TYPE: Dawson 14014, in clumps of other small algae under coral rocks near the northern edge of the seaward reef of Rigili Island, September 2.

The sympodial, distichous branching and very narrow cortical bands are distinctive in this small species despite the absence of fertile material.

Ceramium vagabunde sp. nov.

Fig. 27*e*

Plants minute, 4–5 mm. high, growing among other tufted algae, consisting of a creeping, semi-prostrate basal filament provided with numerous ventral rhizoids from the nodes, giving rise to irregularly and sparsely branched erect branches with blunt, non-forcipate tips; erect axes 120–140 μ in diameter, incompletely corticated, the internodes bare for intervals of 30–70 μ in middle and lower parts; cortical bands 1½–2 times as broad as tall, without secondary growth above or below, the margins even, especially the lower ones, consisting of a narrow inner ring of larger cells and on either side of an outer ring of irregularly arranged small angular cells less than 10 μ in maximum diameter; tetrasporangia cruciate, ovate, about 40 μ in length, borne verticillately within prominently swollen involucres which develop acropetally from the closely juxtaposed distal nodal bands of the erect axes; terminal fertile areas to 220–250 μ in diameter, resembling those of *Equisetum* in form.

Thallis 4–5 mm. altis e filamentis basilaribus repentibus a rhizoideis nodularibus affixis et ramis sparsis irregularibus erectis apicibus obtusis eforcipatis, axilaribus erectis 120–140 μ diametro, cortice interrupto, vittis corticosis nodi 1½–2-plo latioribus quam longis a circulo angusto centrali cellulis majoribus et

lateribus ambis corio cellulis minoribus anguloris ad 10 μ diametro, tetrasporangiis cruciatis ovatis ca. 40 μ longis in involucris valde inflatis eis ex vittis nodoris proxime juxtaposis axilarum erectarum acropetaliter productis, loculis fertilibus terminalibus 220–250 μ diametro eis *Equisetum* similantibus.

TYPE: Dawson 13620a, growing within tufts of *Ectocarpus breviarticulatus* near the margin of the seaward reef opposite EMBL, Parry Island, August 19.

This material is nearest to *Ceramium nakamurai* Dawson from Garanbi, Formosa (*C. equisetoides* Nakamura), but is not dichotomously branched. It is identical with tetrasporangial specimens cited and illustrated by the writer as a probable undescribed species from Isla San Benedicto, Mexico (Dawson 1954a: 6, pl. 4, fig. 2).

Ceramium gracillimum var. *byssoideum* (Harvey) G. Mazoyer; Dawson 1954: 448, fig. 55e, f; Dawson 1956: 53; Taylor 1950: 138 (as *Ceramium byssoideum* Harvey)
D. 13616, 13707, 13715, 13790, 13831, 13860, 13891, 13924, 13916, 13951, 14028.

Ceramium mazatlanense Dawson; Dawson 1954: 448, fig. 55g–j; Dawson 1956: 53
D. 13752, epiphytic on *Caulerpa*.

Ceramium serpens Setchell and Gardner ?; Dawson 1956: 54, fig. 53
D. 13610b, 13857. Both are sterile and not positively identified.

Ceramium taylori Dawson; Dawson 1954: 446, fig. 55b, c
D. 13637, epiphytic on *Udotea*, 13817, 13942.

Centroceras apiculatum Yamada; Dawson 1956: 55, fig. 55
D. 13941a, 14016.

Centroceras clavulatum (C. Agardh) Montagne; Dawson 1954: 446, fig. 54b; Dawson 1956: 55; Taylor 1950: 139
D. 13639, 13794, 13808, 13838, 13958 (this latter collection consists largely of f. *inerme* (Kützing) Piccone. P. 52–29, Aomon Is. shore rocks, 10/22/52.

Centroceras minimum Yamada; Dawson 1956: 54, fig. 54
D. 13640a, 14009a.

Spyridia filamentosa (Wulfen) Harvey; Dawson 1954: 444, fig. 54i, j; Dawson 1956: 56; Taylor 1950: 139
D. 13677, 13816, 13884, 13911. P. 1163, Mui Is. lagoon, 4/11/54; P. 1190, Bokanjoio Is. lagoon, 4/14/54.

Hypoglossum minimum Yamada 1936: 138, fig. 2A—D (Naha, Okinawa)

Fig. 30*c*

D. 13704, 13755, 13901, 13999d. These show considerable variation in form and habit. Those under 13999d, epiphytic on *Halimeda* from a depth of 135 feet, are most like Yamada's type.

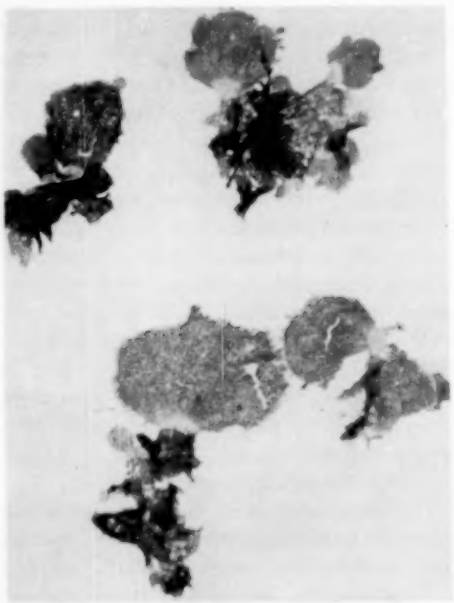


FIG. 28. *Hemitrema fragilis*: Habit of dry plants of D. 13801, × 1.3.

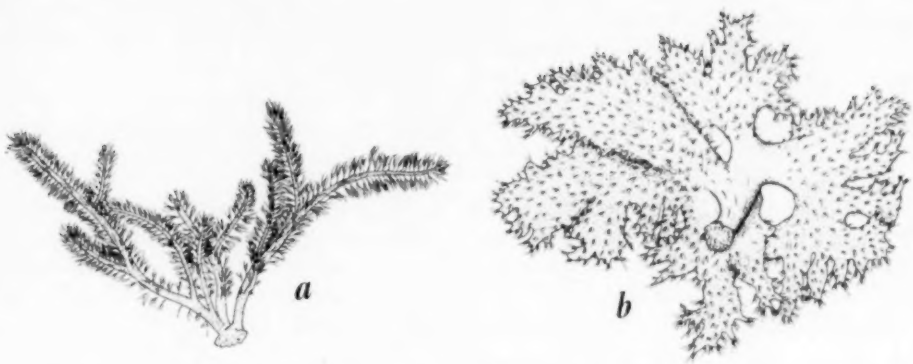


FIG. 29. *a*, *Dasya mollis*, prox.: Habit of a plant of D. 13876, × 4. *b*, *Dasyopsis geppii:* Habit of a young plant of D. 13728 as seen from below, × 3.5.

Taenioma perpusillum (J. Agardh) J. Agardh; Dawson 1954: 451, fig. 58a

D. 14035c. P. 2833a, 1½ mi. off Igurin Is. in the lagoon at 50 ft., 3/16/55.

Hemitrema fragilis (Harvey) comb. nov. *Martensia fragilis* Harvey 1954: 145 (Ceylon); Dawson 1956: 56, fig. 58

Fig. 28

D. 13737, 13801, 14008. Inasmuch as Silva (1952: 291) has pointed out that "*Hemitrema* seems to be the earliest available name for *Martensia*" which is illegitimate, this new combination is called for here.

Dictyurus purpurascens Bory; Dawson 1956: 57; Taylor 1950: 143, pl. 78, fig. 1

D. 13773. P. 2836, Parry Is. seaward reef edge near EMBL, 4/4/54.

Dasya iyengarii Børgesen 1937: 345, figs. 16, 17 (Pam ban Bridge, South India)

Fig. 22*b*

D. 13608, 13624, 13803, 13890, 14051. These specimens are somewhat variable in stature and in detail of branching, but seem to be essentially identical with the south Indian plant. The epiphytic specimens under D. 13608 are especially like the type. Saxicolous specimens under D. 13624 are provided with somewhat more attenuate and less curved and hooked penicilli, but appear otherwise to be like the epiphytic form. The best stands of the plant occur near the margin of the seaward reefs where the species may be dominant in some areas.

Dasya mollis Harvey, prox.; Harvey 1853: 62 (Key West, Florida); Taylor 1928: 173, pl. 26, fig. 13

Fig. 29*a*

D. 13876. This small, completely corticated plant seems best referred here, but the sterile material is insufficient for positive identification. It differs from Atlantic material mainly in the shorter cells of the ramelli.

Dasya adhaerens Yamada 1944: 43, pl. 7, fig. 1 (Ant Atoll, Caroline Islands); Taylor 1950: 141, pl. 79, fig. 1

T. 46-392. Not collected again.

Dasyopsis geppii Weber van Bosse 1913: 130, pl. 13, figs. 18–20, pl. 14, fig. 33 (reefs and to 20–25 fathoms at four Indian Ocean localities indicated)

Fig. 29*b*

D. 13728, 14007. Except for the more pronounced peltate form of some, these agree very well with the account of the "Sealark Expedition" material. Some of them show a

habit more like that of *Dasyopsis palmatifida* W. v B. from the same localities, and suggest further that it is only a variant of *D. geppii*.

Heterosiphonia wurdemannii var. *laxa* Børgesen; Dawson 1956: 57, fig. 60; Taylor 1950: 140 (as *H. wurdemanni*)

D. 13609, 13698, 13739, 13750, 13781, 13760, 13895, 13999. A common small species growing under a variety of conditions and showing variable habit but mostly tending toward Børgesen's var. *laxa*.

Polysiphonia coacta Tseng, prox.; Dawson 1954: 456, fig. 60g, h; Dawson 1956:57
D. 13857d, 13922.

Polysiphonia subtillissima Montagne; Dawson 1954: 454, fig. 60c; Dawson 1956: 58
D. 13904.

Polysiphonia tongatensis Harvey; Dawson 1954: 454, fig. 60d, e; Dawson 1956: 57
D. 13644, 13906, 13933, 13925, 13950c.

Tolypiocladia calodictyon (Harvey) Silva; Dawson 1956: 58, fig. 62; Taylor 1950: 148, pl. 57, fig. 2 (as *Rochera calodictyon*)

D. 13625, 13705, 13881, 13834, 13899, 13957. P. 18129, Runo Is. lagoon at 60 ft., 3/8/55; P. 2500, ¼ mi. off Engebi Is. in lagoon at 15 ft., 3/2/55; P. 2816, s.e. end of Bokanjoio Is. in lagoon at 60 ft., 3/8/55; P. 22x, Runit Is. n.w. tip on channel, 10/22/52; P. 60, off n. tip of Igurin Is. in lagoon at 20 ft., 10/28/52; P. 1153, Engebi Is. lagoon, 4/11/54.

Herposiphonia secunda (C. Agardh) Ambronn; Dawson 1956: 58, fig. 63; Taylor 1950: 148
D. 14002a, growing on the membrane of *Valonia ventricosa*.

Herposiphonia tenella (C. Agardh) Ambronn; Dawson 1954: 452, fig. 59a; Taylor 1950: 147; Dawson 1956: 59
D. 13771a, 13904a, 13914, 14017.

Lophosiphonia bermudensis Collins and Hervey; Dawson 1956: 59, fig. 65
D. 13696, 13903a, 13999a, 14035b. My attention has been called to the fact that Howe (1918: 521) has reduced this species under *Dipterosiphonia rigens* (Schousb.) Falkenb. It appears that a more critical review is called for than can be attempted here.

Lophosiphonia obscura (C. Agardh) Falkenberg; Dawson 1954: 451, fig. 58d, e
D. 13648, 13867. The latter is virtually identical with Børgesen's 1918 figure of tetrasporic material.

Laurencia mariannensis Yamada; Dawson 1956: 60, fig. 66; Taylor 1950: 144, pl. 55, fig. 1
D. 13747. P. 2587a, Aitsu Is., 2/11/55; P. 2832, Igurin Is. lagoon at 50 ft., 3/16/55.

Laurencia nana Howe 1920: 566 (Mariguana, Bahamas)

Fig. 30*a*

D. 13725. These fertile specimens are in excellent agreement with Howe's description, including the palisade cortical cells, the presence of rhizoidal haptera and the lack of lenticular thickenings.

Laurencia parvipapillata Tseng; Dawson 1954: 458, fig. 61g
D. 13754, 13964. P. 2833, Igurin Is. lagoon at 50 ft., 3/16/55.

Chondria minutula Weber van Bosse 1923: 349, pl. 10, figs. 10, 12 (Tanah Djampea Is., Indonesia)

Fig. 30*d*, *e*

D. 13744, 13771, 13932a, 13788a. The tetrasporic and cystocarpic material seems to agree well with Weber van Bosse's account of the type which had a similar creeping habit and the same stature.

Chondria polyrhiza Collins and Hervey 1917: 121, pl. 2, fig. 12 (Bermuda)

Fig. 30*b*

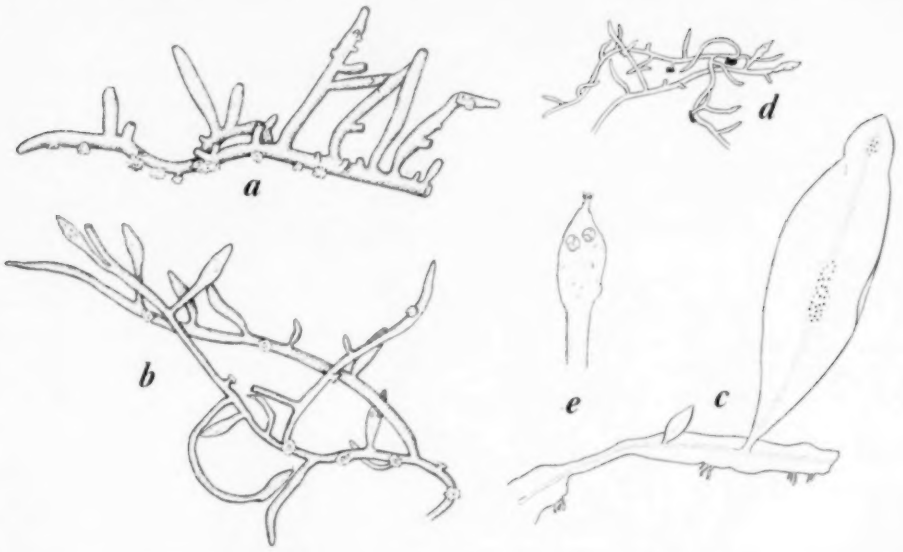


FIG. 30. *a*, *Laurencia nana:* Habit of a plant of D. 13725, × 4. *b*, *Chondria polyrhiza:* Habit of a plant of D. 13795 from the under side, × 10. *c*, *Hypoglossum minimum:* Part of a tetrasporangial plant of D. 13704 showing rhizoids, branching from the midrib, and a sorus, × 6. *d*, *e*, *Chondria minutula: d*, Habit of a plant of D. 13744, × 5; *e*, detail of the apex of a tetrasporic branch of the same showing the emergent tip and trichoblasts, × 35.

D. 13795. This seems to fit the Collins and Hervey description and figures well. Under D. 14027 two forms are present, one with axes to 450 μ in diameter and with rather blunt tips, the other with axes only about 220 μ in diameter and more attenuate tips. They probably represent growth stages.

Chondria repens Børgesen; Dawson 1954: 460, fig. 62d, e; Dawson 1956: 60
D. 13932.

BLUE-GREEN ALGAE

Anacystis dimidiata (Kützing) Drouet and Daily 1952: 221. *Trochiscia dimidiata* Kützing 1833: 593, fig. 75 (Germany). Taylor 1950: 103 (as *Gloeocapsa turgida* (Kütz.) Hollerbach [*Chroococcus turgidus* (Kütz.) Nägeli])

Fig. 31*a*

P. 2830, Igurin Is. scum on rocks in lagoon at 50 ft., 3/16/55.

Coccochloris stagnina Sprengel 1807: 14 (Halle, Germany)

Fig. 31*b*

D. 13893, 14043. P. 1235–6, Bogombogo Is. lagoon, 4/22/54; P. 2801, Bokanjoio Is. seaward flats. 10/25/54.

Gomphosphaeria aponina Kützing 1836: Dec. 16, no. 151 (Abano, Italy); Taylor 1950: 103

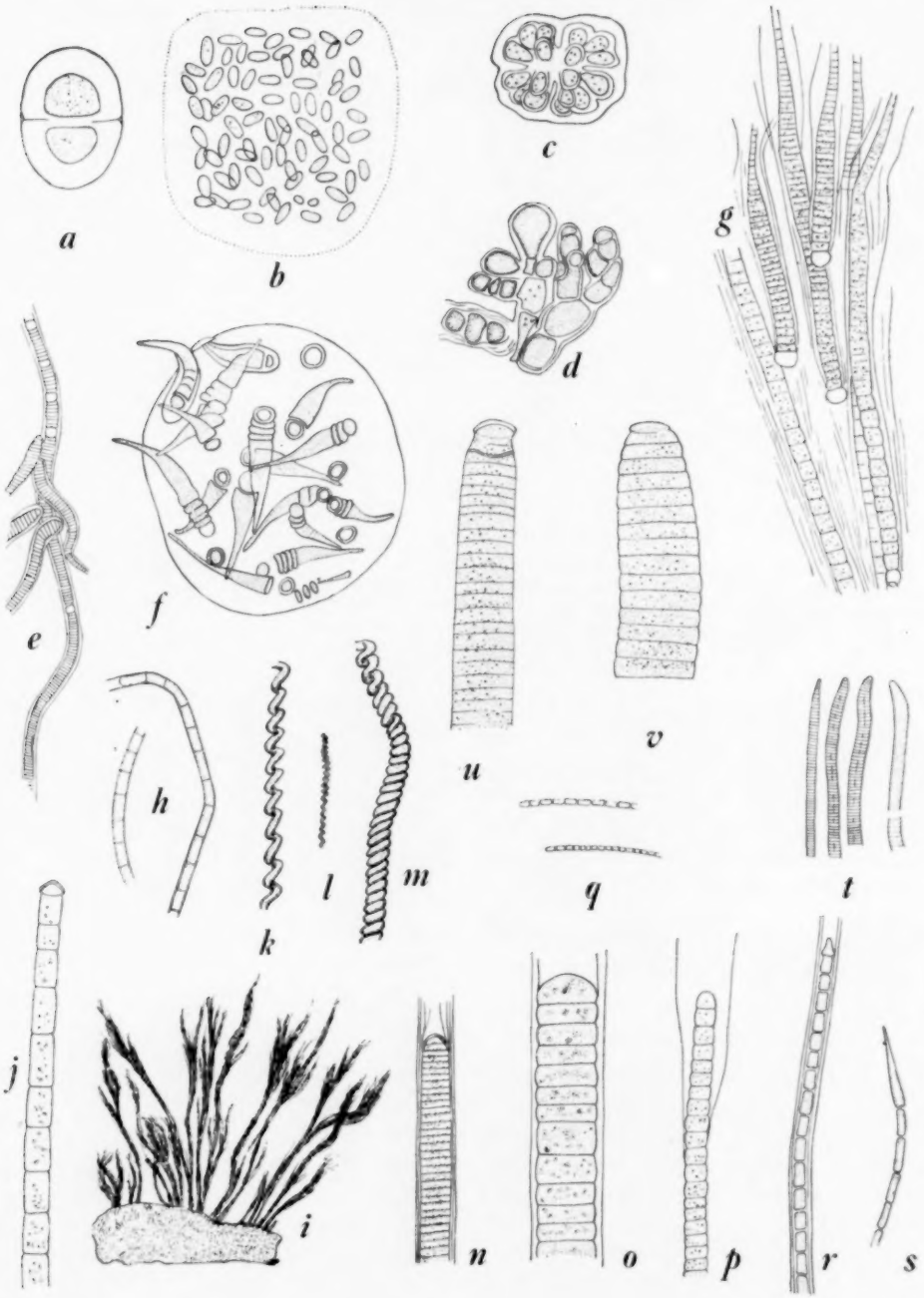
Fig. 31*c*

T. 46–316. Not collected again.

Entophysalis conferta (Kützing) Drouet and Daily; Dawson 1954: 379, fig. 3r
D. 13664.

Entophysalis deusta (Meneghini) Drouet and Daily 1948: 79. *Coccochloris deusta* Meneghini 1841: 173 (Genoa, Italy). Taylor 1950: 104 (as *E. granulosa* Kütz.)

Fig. 31*d*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D. 13673, 13878b.

Hormothamnion enteromorphoides Grunow seq. Bornet and Flahault; Dawson 1954: 379, fig. 3n; Taylor 1950: 105
D. 13680, 13682. P. 22, Rigili Is., 8/10/49.

Plectonema nostocorum Bornet seq. Gomont 1893: 102, pl. 1, fig. 11 (type not indicated); Taylor 1950: 105.
T. 46–304. Not collected again.

Plectonema terebrans Bornet and Flahault seq. Gomont 1893: 103 (Le Croisic, Atlantic France)

D. 13878a, 14020. P. 2830, Igurin Is. lagoon rocks at 50 ft., 3/16/55.

Scytonema polycystum Bornet and Flahault 1887: 90 (Noumea, New Caledonia)
D. 13955.

Scytonema myochrous (Dillwyn) C. Agardh seq. Bornet and Flahault is reported by Palumbo 1950 from Eniwetok without locality, based upon a determination by F. Drouet.

Calothrix crustacea Thuret seq. Bornet and Flahault 1886: 359 (Le Croisic, Atlantic France)

Fig. 31*e*

D. 13621, 13662, 13687, 13868.

Rivularia atra Roth seq. Bornet and Flahault 1886: 353 (Europe)

Fig. 31*f*

D. 13663.

Rivularia polyotis (J. Agardh) seq. Bornet and Flahault 1886: 360 (Mediterranean Sea)

Fig. 31*g*

D. 14034.

Phormidium crosbyanum Tilden 1910: 96, pl. 4, figs. 60, 61 (Waianae, Oahu, Hawaiian Islands); Taylor 1950: 109

Fig. 31*b*

D. 13670, 13880, 14052. P. 2800, Mui Is. seaward flats, 10/21/54; P. 2841, Eneroul Is. seaward flats, 9/23/54; P. 2818, Bokanjoio Is. sand flats on east side, 3/8/55.

Phormidium penicillatum Gomont 1893: CLIX, pl. IV, figs. 5–7 (Borbon Is., Mascarene Islands)

Fig. 31*i*, *j*

D. 13714, 13780, 13963.

Oscillatoria nigro-viridis Harvey seq. Gomont; Dawson 1954: 380, fig. 3g
D. 13686.

Spirulina major Kützing seq. Gomont 1893: 251, pl. 7, fig. 29 (Germany)

Fig. 31*k*

D. 13885.

Spirulina subsalsa Oersted seq. Gomont 1893: 253, pl. 7, fig. 32 (Denmark)

Fig. 31*m*

D. 13662a, 13846.

◀ FIG. 31. *a*, *Anacystis dimidiata:* × 600 approx. (after West). *b*, *Coccochloris stagnina:* × 600 approx. (after Lemmermann). *c*, *Gomphosphaeria aponina:* × 600 approx. (after West). *d*, *Entophysalis deusta:* × 600 approx. (after Engler and Prantl). *e*, *Calothrix crustacea:* × 500 approx. (after Bornet and Thuret). *f*, *Rivularia atra:* × 600 approx. (after Wille). *g*, *Rivularia polyotis:* × 600 approx. (after Bornet and Thuret). *h*, *Phormidium crosbyanum:* × 600 approx. (after Tilden). *i*, *j*, *Phormidium penicillatum: i*, Habit, × 0.8; *j*, detail of a trichome, × 580 (after Bornet). *k*, *Spirulina major:* × 600 approx. (after Gomont). *l*, *Spirulina tenerrima:* × 600 approx. *m*, *Spirulina subsalsa:* × 600 approx. (after Gomont). *n*, *Lyngbya semiplena:* × 600 approx. (after Gomont). *o*, *Lyngbya sordida:* × 600 approx. (after Gomont). *p*, *Lyngbya gracilis:* × 600 approx. (after Gomont). *q*, *Schizothrix lacustris:* × 600 approx. (after Gomont). *r*, *Symploca laeteviridis:* × 600 approx. (after Gomont). *s*, *Microcoleus tenerrimus:* × 600 approx. (after Gomont). *t*, *Hydrocoleum glutinosum:* × 600 approx. (after Kützing). *u*, *Hydrocoleum comoides:* × 600 approx. (after Gomont). *v*, *Hydrocoleum cantharidosmum:* × 600 approx. (after Gomont).

Spirulina tenerrima Kützing seq. Gomont 1893: 252 (Europe)

Fig. 31*l*

D. 13799, 13970.

Lyngbya aestuari (Mertens) Liebmann seq. Gomont; Dawson 1954: 380, fig. 3a; Taylor 1950: 110
D. 13659, 13684, 13855, 13878, 13984.

Lyngbya confervoides C. Agardh seq. Gomont; Dawson 1954: 380, fig. 3b, c; Taylor 1950: 110
D. 13940, 14038.

Lyngbya majuscula (Dillwyn) Harvey seq. Gomont; Dawson 1954: 380, fig. 3d; Taylor 1950: 111
D. 13646, 13690, 13784, 13844, 13848, 13882, 13960, 13965, 13985. P. 2853, Rigili Is. sea beach, 11/17/54; P. 14, Engebi Is. n.w. end at 6 ft., 8/11/49; P. 2828, Igurin Is. 1½ mi. off at 50 ft., 3/8/55.

Lyngbya meneghiniana (Kützing) seq. Gomont 1893: 125 (Europe); Taylor 1950: 109
D. 13681, 13683, 13885a, 13984a.

Lyngbya semiplena (C. Agardh) J. Agardh seq. Gomont 1893: 138, pl. 3, figs. 7–11 (Adriatic Sea)

Fig. 31*n*

D. 13686a, 14041. P. 57b, Rigili Is. seaward pavement, 10/27/52.

Lyngbya sordida (Zanardini) seq. Gomont 1893: 126, pl. 2, fig. 21 (Venice, Italy); Taylor 1950: 110, pl. 79, fig. 2

Fig. 31*o*

D. 13789, 13931, 13966, 14030. P. 52–18, Runit Is. flats at w. tip, 10/22/52. P. 52–104, Aaraanbiru Is. lagoon s.w. end, 11/7/52.

Lyngbya sordida f. *bostrychicola* Crouan seq. Gomont 1893: 126 (near Brest, France)
D. 13783.

Lyngbya gracilis (Meneghini) Rabenhorst seq. Gomont 1893: 124, pl. 2, fig. 20 (Atlantic France); Taylor 1950: 109

Fig. 31*p*

T. 46–421. Not collected again.

Schizothrix lacustris A. Braun seq. Gomont 1892: 301, pl. 6, figs. 9–12 (Germany); Taylor 1950: 112

Fig. 31*q*

T. 46–333, Runit Is. seaward reef flat, May 1946. Not collected again.

Symploca hydnoides Kützing seq. Gomont; Dawson 1954: 380, fig. 3o, p
D. 13641, 13689, 13839, 13993, 14042. P. 2839, Runit Is. n.w. tip flats in channel, 10/22/52; P. 2809, Bokanjoio Is. lagoon, 3/8/55; P. 2838, Mui Is. lagoon, 4/11/54; P. 1151, Runit Is. n. tip channel, 4/11/54; P. 2843, Bogombogo Is. seaward flats, 10/5/54.

Symploca laete-viridis Gomont 1893: 109, pl. 2, figs. 6–8 (Key West, Florida); Taylor 1950: 113

Fig. 31*r*

D. 13833.

Microcoleus tenerrimus Gomont 1892: 355, pl. 14, figs. 9–11 (France)

Fig. 31*s*

D. 13659a, 13872.

Hydrocoleum coccineum Gomont 1892: 342, pl. 13, figs. 1, 2 (on *Codium* Antibes, Mediterranean Sea); Taylor 1950: 115
D. 13779. This species is similar to *H. lyngbyaceum* but differs in its red to pale blue-green protoplasm (bright blue-green, olive

or yellow green in *H. lyngbyaceum*). In the latter the cross walls are granulated unlike *H. coccineum*.

Hydrocoleum glutinosum (C. Agardh) Gomont 1892: 339 (Sweden)

Fig. 31*t*

D. 13661, 13668, 13756, 13842.

Hydrocoleum comoides (Harvey) seq. Gomont 1892: 335, pl. 12, figs. 3–5 (Australia); Taylor 1950: 115

Fig. 31*u*

D. 13638, 13685, 13688, 13716, 13733.

Hydrocoleum lyngbyaceum Kützing seq. Gomont; Dawson 1954: 380, fig. 3q

D. 13653, 13667, 13671, 13827, 13870. P. 2543, Runo Is. seaward reef, 3/8/55; P. 2802, Bokanjoio Is. seaward flats, 10/25/54; P. 2810, Bokanjoio Is. lagoon, 3/8/55; P. 2823, Bokanjoio Is. seaward reef, 3/8/55; P. 2852, Mui Is. lagoon, 11/17/54; P. 2856, Aitsu Is. lagoon, 11/17/54.

Hydrocoleum cantharidosmum (Montagne) seq. Gomont 1892: 336, pl. 12, figs. 6, 7 (Canary Islands); Taylor 1950: 116

Fig. 31*v*

T. 46–312. Not collected again.

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NOTES

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During an examination of the viscera of Marshallese fishes the writers' attention was drawn to the fact that all of our specimens of *Gomphosus varius* in which the sex could be determined were females, and that all specimens of *G. tricolor* were males. Suspecting the possibility of sexual dimorphism, we collected additional material, so that this study of *Gomphosus* ultimately included 56 specimens from Eniwetok, 4 from Bikini, 3 from Arno (all atolls in the Marshall Islands), and 15 from Oahu and Kauai in the Hawaiian Islands. Seven Marshallese and 3 Hawaiian specimens were *tricolor*, according to various descriptions; 14 Marshallese specimens were the distinctively marked juveniles of *varius*; and the remaining 54 were typical *varius*. Eight of the 10 *tricolor* proved to be males, one was decomposed internally, and another was too immature to be sexed. Sex could not be determined for any of the 14 juvenile *varius*, but 39 of the larger specimens were females in various stages of maturity while 15 were immature and could not be sexed.

The major taxonomic difference between *tricolor* and *varius* is color and color pattern. In life *tricolor* is a rich blue-green with a vertical yellow-green bar across the trunk near the pectoral insertion. Its head and caudal fin tend to be rather more bluish than the rest of the body, and in large specimens the caudal fin is somewhat lunate. *G. varius* is somberly colored in comparison, being plain black posteriorly and creamy white to light brown anteriorly, each antero-dorsal scale having a dark spot at its base. The breast and cheeks are white or cream, the snout tip is reddish, and a narrow black stripe runs the length of the head at the level of the pupil. Small juveniles of *varius* are bright yellow-green dorsally, plain white laterally and ventrally, and have a pair of lengthwise black stripes from the snout tip to the caudal base. They also differ from larger specimens in that they either lack or are just developing the elongate snout characteristic of the genus. Jordan and Evermann (1905. *U. S. Fish Comm., Bul.* 23: pl. 36) present a color plate of *tricolor* and in the same work (*op. cit.*, p. 289, fig. 125) a black and white drawing of *varius*.

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males and also tend to have lunate caudal fins. More than likely an histological examination of the gonads of small "*varius*" would show both sexes displaying the *varius* or juvenile color pattern.

Marked sexual dimorphism, expressed as coloration differences, is not unusual among the labroid fishes. Longley (Longley and Hildebrand, 1941. Papers from Tortugas Lab. 34: 196–198) showed that in *Thalassoma bifasciatum* only adult males attain the *bifasciatum* color pattern, whereas females and young males exhibit a coloration so characteristic that they were long called *T. nitidum*. Recently Randall (1955. *Copeia* 3: 237) has demonstrated that *Stethojulis renardi* is merely the adult male of *S. strigiventer*, and Brock and Yamaguchi (1954. *Copeia* 2: 154–155) have shown that *Scarus ahula* is the female of *S. perspicillatus*. The latter authors contrast the bright blue, green, and yellow pattern of male *perspicillatus* with the rather drab pattern of the female, a situation quite similar to that obtaining in *Gomphosus*.

One line of evidence which seems to cast doubt on our hypothesis that *tricolor* and *varius* are dimorphic forms of the same species is their pattern of distribution and relative abundance. In the 2-to 35-foot depth range sampled for this study *tricolor* occurred mostly in deeper water and was uncommon even there. *G. varius*, on the other hand, seemed to be uniformly distributed throughout this range and was common to abundant. Every rotenone or sight-observation station yielding *tricolor* also produced *varius*, but the reverse was certainly not true. Disjunctive distributions and aberrant sex ratios such as those found in this study do not necessarily indicate that *varius* and *tricolor* are separate species, particularly in view of Gosline and Strasburg's recent work (1956. *Copeia* 1: 9–18), on the even more markedly dimorphic Hawaiian moringuid eels.

The name to be applied to our *Gomphosus* cannot be verified at this time. *Gomphosus varius* Lacepede (1802. *Hist. Nat. Poiss.* 3:100, 104) predates *G. tricolor* Quoy and Gaimard (1824. Voyage *Uranie*, Zool.: 280), the type localities being Tahiti and the Hawaiian Islands respectively. We accordingly refer our material to *varius*, but with the following reservation. In the Indian Ocean the central Pacific forms of *Gomphosus* are replaced by two or three other species, one or two of which may be identical with the Pacific *varius*. Based on our experience it would appear that sexual dimorphism is also present in the Indian Ocean *Gomphosus*, and that males may occur as either the blue-green *tricolor* form or as a violet-blue species called *coeruleus*. The precise relationship of the Indian Ocean to the Pacific *Gomphosus* remains to be demonstrated. When this is done it may be that what we here call *varius* will be synonymized with *coeruleus*.

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DR. ELMER D. MERRILL, 1876–1956

Last year marked the passing of the outstanding bibliographer of the Pacific area, Dr. E. D. Merrill, botanist, bibliographer, and administrator; man of prodigious energy, broad vision, and deep understanding of problems and people; and a valued friend.

I wish here to pay tribute to the memory of the man to whom we owe so much. Extracts from his contributions to science were republished with subsidiary material in Chronica Botanica[1] at a time when he could still appreciate the honor. His autobiography of his Philippine and California days was published in the Asa Gray Bulletin.[2] Thus most of the essential facts concerning this leader and builder need no further elaboration.

Before December, 1928 Dr. Merrill was to me just the great man who had been Director of the Bureau of Science in Manila and who had developed Philippine botany and the great herbarium in the capital of those islands. He was the one who by then had undertaken the study of the flora of Hainan, and had stimulated the study of botany in many institutions in China, especially by the Chinese themselves. To him had gone all collections made at Lingnan University, Canton, China, where I had taught from 1922 to 1926. He was dean of the Agricultural College of the University of California in June 1928, when I became an aide in the Division of Plants, U.S. National Herbarium, Smithsonian Institution. I was employed to bring order out of the large and partly worked Chinese and other Asiatic collections. Thus I joined the ranks of the very small number of workers on the botany of China. Dr. Merrill was out front, I far in the rear. However, on a trip to Washington he came around to "look me over." With his characteristically direct question, "What are you doing about the literature?", I started with almost no previous experience in this field to become a bibliographer. A year later we became collaborators in the "Bibliography of Eastern Asiatic Botany," which left the press nearly ten years later. My association with Dr. Merrill continued until his death.

Dr. Merrill's two most outstanding characteristics were breadth of vision and limitless capacity for work. He began in Manila with nothing but his own strong qualities. Before that field was well under way he had reached out to small but important Amboina in the East Indies, unknown Borneo, American possessions in the Pacific Islands, notably Guam, and then Hainan Island and China. His influence was felt in institutions in Europe, America, and Asia. To some he is a symbol of over-extension, leaving a trail of unfinished works behind him. But he left the polish and fine points to others who could not see the need for plowing widely if not deeply, in other fields related to his own. Indeed he was extended, yet he knew this limitation. "Here it is," he said, "as far as I can do it with my limited time and resources. Let others pick up from here." So ran his philosophy. Then he turned to other things, leaving behind him, it is true, great collections named merely "by sight," but collections actually made in the first place simply because people knew that Merrill would name them. And because of his determining of these vast collections they were placed where the plodding taxonomists could get them and polish them. Nor did he stop there, but continued on, stimulating, directing and sometimes working with others on these great collections, as one can see by perusing his bibliography and noting the joint authorships. Many are the institutions in whose history Merrill's name needs major mention for his direct and indirect influence upon their growth.

Merrill's breadth of vision made him see the

[1]Merrilleana; a selection from the general writings of Elmer Drew Merrill, Sc.D., LL.D. Chronica Botanica 10(3/4): 131–393. 6 *illus.* 1946.

[2]E. D. Merrill—Autobiographical: Early years, the Philippines, California. Asa Gray Bulletin N. S. 2(3/4): 335–370. 5 *f.* 1953.

need for clearing up confusion in older, neglected but fundamental works. He interpreted the basic works by Blanco, Loureiro, Rafinesque, and others. He sought new collections to stand in place of important old ones no longer existing or lost. He instituted great improvements in various herbaria and seized the opportunities which fell across his path to carry on these programs. Most noteworthy of these opportunities, so far as I am aware, was the Works Progress Administration project, born of the depression in the early '30's and designed to give useful work to the unemployed. Nor did he seize this opportunity just for himself and the organization of which he was by then the Director, the New York Botanical Garden. His typists, whom he had literally by the dozen, made carbons of the original and critical descriptions, which they copied at his direction from otherwise unduplicated literature. Extra copies of these he sent to other institutions, even though at first they were often not warmly received. He realized what the WPA workers could do for the prodigious drudgery of bibliographic work and assigned the best of his staff to our joint "Bibliography of Eastern Asiatic Botany." This work is a monument to his vision and to the many devoted WPA workers whom he selected and inspired by his tirelessness and his confidence in their ability to do the job well.

I think no undertaking exemplifies his breadth of vision more than his acquisition and distribution of seeds of the now widely known *Metasequoia* from interior China. His limited funds were spent, not to take him to the haunts of this newly found "living fossil," but to enable trusted Chinese collectors to go, unencumbered by accompanying foreigners, to gather a generous supply of seeds. These were sent to Dr. Merrill, then Director of the Arnold Arboretum and Administrator of Botanical Collections at Harvard University. He distributed the seeds to institutions the world over, wherever he thought there was a chance they would be planted and cared for. Thus were determined by one extensive experiment the optimum conditions, and the range of possibilities for the growth of this most interesting remnant from the past.

Naturally Merrill left much unfinished. His sizeable book on Cook's voyages was his last finished contribution. It contains much of his distinctive and forceful philosophy, colored, as is to be expected, by the circumstances of his condition and time of life. His belief in immortality was his confidence in the enduring worth of the foundations he had laid down and the ability of others to build thereon. I take strength from the confidence expressed in his turning over to Dr. F. R. Fosberg and me his papers and interest in an eventual fourth edition of the Pacific bibliography.

Dr. Merrill's influence on botany is not ended; it continues through me and many other "Merrill-men," a designation I cherish. He wrote and worked tirelessly for his chosen subject, broadly interpreted in time and space.

Egbert H. Walker

News Notes

Ninth Pacific Science Congress

The Ninth Pacific Science Congress of the Pacific Science Association will take place in Bangkok, November 18 to December 9, 1957. It is being held under the auspices of His Majesty's Government of Thailand and the Science Society of Thailand.

Secretary-General of the Congress is Dr. Charng Ratanarat, Department of Science, Ministry of Industry, Bangkok, Thailand.

Present plans call for organization of the Congress into these divisions: Geology and Geophysics, Meteorology, Oceanography, Fisheries, Zoology, Entomology, Botany, Conservation, Museums, Soil and Land Classification, Forest Resources, Crop Improvement, Coconut Problems, Animal Improvement, Chemistry in the Development of Natural Resources, Anthropology and Social Sciences, Public Health and Medical Sciences, and Nutrition. — Pacific Science Association, Information Bulletin.

Pacific Radiocarbon Dates

An article in *Science* (124:3224, 12 Oct. 1956) presents the first set of radiocarbon dates released by Professor H. R. Crane of the University of Michigan Radiocarbon Dating Laboratory. Pacific dates include a series from Japan, Korea, China, and Manchuria, as well as from Pacific islands.

For the Pacific islands, there is a series of nine dates from materials collected for the University of California expedition, 1952, by E. W. Gifford and Dick Shutler, Jr., from New Caledonia. This is the greatest number of dates covering the longest cultural time-span that has been obtained for any Pacific island. The terminal dates are 2800 $\pm$ 350, and 615 $\pm$ 300. The oldest date, circa 844 B. C., is the earliest radiocarbon date for man in Melanesia.

The New Caledonians speak a Malayo-Polynesian language. As the linguistic relations of New Caledonian and other M-P languages in Polynesia and Melanesia are presently being worked on, it is hoped that through the method of glottochronology and the radiocarbon method it will be possible to relate the occupation of New Caledonia to both Polynesia and Melanesia.

For Fiji, (University of California expedition of 1947, E. W. Gifford), there are six dates, of which the oldest is 2000 $\pm$ 500.

For purposes of comparison, the earliest radiocarbon date for man in the Hawaiian islands is A. D. 1004 $\pm$ 180.

This series of radiocarbon dates marks a major advance in assembling a series of dates for Oceania adequate to establish the temporal framework for the human occupation of the area.—Pacific Science Association, Information Bulletin.

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Original copy and one carbon copy of manuscript should be submitted. The author should retain a carbon copy. Although due care will be taken, the editors cannot be responsible for loss of manuscripts.

Introduction and summary. It is desirable to state the purpose and scope of the paper in an introductory paragraph and to give a summary of results at the end of the paper.

Dictionary style. It is recommended that authors follow capitalization, spelling, compounding, abbreviations, etc., given in *Webster's New International Dictionary* (unabridged), second edition; or, if desired, the *Oxford Dictionary*. Abbreviations of titles of publications should, if possible, follow those given in U. S. Department of Agriculture *Miscellaneous Publication 337*.

Footnotes. Footnotes should be used sparingly and never for citing references (see later). When used, footnotes should be consecutively numbered by superior figures throughout the body of the paper. Footnotes should be typed in the body of the manuscript on a line immediately below the citation, and separated from the text by lines running across the page.

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BATZO, RODERICK L., and J. K. RIPKIN. 1849. *A treatise on Pacific gastropods.* vii + 326 pp., 8 figs., 1 map. Rice and Shipley, Boston.

CRAWFORD, DAVID L. 1920*a*. New or interesting Psyllidae of the Pacific Coast (Homop.). *Ent. News* 31 (1): 12–14.

——— 1920*b*. Cerotrioza (Psyllidae, Homoptera). *Hawaii. Ent. Soc., Proc.* 4 (2): 374–375.

ROCK, JOSEPH F. 1916. The sandalwoods of Hawaii; a revision of the Hawaiian species of the genus *Santalum*. *Hawaii Bd. Commrs. Agr. and Forestry, Div. Forestry Bot., Bul.* 3: 1–43, 13 pls.

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